Review of the 2002 Fraser River Sockeye Fishery

Report by the External Steering Committee

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Executive Summary

Conservation of Fraser River sockeye salmon stocks in 2002 was challenged by an unprecedented set of constraints. Managing within these constraints required severe restriction of harvest regimes for First Nations, and commercial and recreational harvesters. These restrictions resulted in reduced catches of an abundant run, and escapement goals were exceeded. The foregone harvest opportunity sparked significant protests and public controversy over management decisions made in season.

This review of the 2002 fishery was conducted to evaluate the pre-season plan and in-season decision making to assess if anything could have been done differently, and to provide recommendations to guide future management of Fraser River sockeye.

For 2002, the forecast abundance of Fraser River sockeye was average to below average for the cycle. It was anticipated that fisheries would target the Summer run stock aggregate occurring from late July to mid August, avoiding less abundant Early Stuart, Early Summer and Late run sockeye.

It is always easier to second guess management of Fraser River sockeye from the hind sight of final information. However, given unknown changes in the behaviour of Late run sockeye stocks, managers were faced with very high risk decisions that had to be based on highly uncertain data and conflicting user group objectives.

Exceptional concerns were identified for Late run sockeye due to very high rates of in-river pre-spawn mortality that have occurred since 1996. As well, the Cultus Lake sockeye population, a component of the Late run, was specifically identified as a particular conservation concern. An exploitation rate limit of 15% on Late run sockeye was adopted in 2002 to address these concerns. However, the management plan provided for additional harvest opportunities if there was sufficient abundance and a delay in the return of Late run sockeye to the river of four to six weeks, consistent with their historical migration patterns.

With the start of commercial fishing in late July, it became apparent that returns were greater than forecast, even before official upgrades of the in-season estimates of abundance were announced. The 15% limit was reported as being met on August 8. An adjustment to the implementation of the 15% limit was adopted on August 9 and some additional fishing opportunities were provided from August 10 to 14. The adjustment to the 15% limit on Lates did not, however, allow for exploitation of available Summer run sockeye at levels they could well have supported. With further upgrades in the estimated abundance of Late run sockeye, additional harvest opportunities were provided from August 28 to 30, consistent with the 15% limit.

In the course of the review, one of the questions related to foregone catch in the commercial fishery as a result of management decisions in 2002. Specifically, it was asked if the total catch could have been increased by authorising additional fisheries in the Fraser River throughout August rather than authorizing additional fisheries in

Johnstone and Juan de Fuca straits. This strategy would take advantage of lower Late run proportions in the Fraser River in contrast to the approach area fisheries. This could have resulted in increasing the numbers of Summer run sockeye that could have been harvested while not exceeding the 15% harvest rate ceiling on Late run stocks. However, this strategy would also result in a severe imbalance in the distribution of allocation of catch and fishing opportunities. For example the Area E (Fraser River gillnet) catch would have been significantly greater than the 45.0% of the total actual commercial catch and its pre-season target allocation of 28.5%. In addition, the fishing opportunities in Johnstone and Juan de Fuca straits would have been minimal. The Integrated Fisheries Management Plan (IFMP) did not provide policy guidance nor was there industry consensus that indicated that maximizing Canadian catch would take priority over balancing commercial gear sector allocation. There was also no consensus amongst the commercial fleet representatives to change to alternative fishing scenarios to maximize Canadian catch due to impacts on allocation. As a result of no industry consensus the Department chose to balance commercial sector allocations instead of maximizing Canadian commercial catch. The future IFMPs will need to deal with this policy issue explicitly in order to provide clear direction for future circumstances.

By September 1, 2002, harvest opportunities for Fraser River sockeye were essentially over due to concerns for upper Fraser and Thompson River coho.

With a three-fold increase in the in-season estimate of Late run sockeye abundance, commercial fishing interests protested adherence to the 15% limit, which they saw as unnecessarily restrictive and inflexible. They also questioned the process and timeliness of in-season decision making, with particular focus on the availability of information to support in-season management.

A critical management challenge was the uncertainty regarding the extent of pre-spawning mortality of Late run sockeye. Some Late run sockeye returned to the river during the third week of July, a record early return, which led to speculation that the mortality rate would be very high. A portion of the Late run, however, remained in the Strait of Georgia and there was no way of determining how long those fish would continue to hold or what their mortality rate would be once they did return to the river. Although the pre-spawning mortality problem for Late run sockeye is being studied extensively, no definitive cause has been determined. Therefore, pre-season and in-season estimates are highly uncertain. In this environment, managers operated within the structure of the established decision rules.

Results finalized in March show that the exploitation rate on the Late run was consistent with the 15% limit (12.8% exploitation rate on Late run sockeye, excluding fish caught in the river before August 17). Escapements for Early Summer, Summer and Late run sockeye were well above target levels due to greater than forecast abundance and significant restrictions on harvest. Reduced in-river mortality (approximately 20%) for Late run sockeye also resulted in a significantly higher than expected escapement. The extent to which escapement goals were exceeded represents foregone harvesting opportunities with serious economic consequences for commercial interests.

There are a number of key concerns that emerged from the review. First, there is a lack of clarity around policy objectives for conservation of wild salmon. While all groups support conservation, there is no consensus over conservation units, escapement goals, and levels of acceptable risk for management of harvest. Second, there are concerns about the transparency, participation, and timeliness of consultation on pre-season management plans and in-season decision making. Third, the process for development of the Integrated Fisheries Management Plan requires improvement. Fourth, there are shortcomings with respect to in-season management that need to be addressed. In particular, new approaches to collection of data in-season, improved planning of enforcement, and work on stock assessment are required. Finally, management of Fraser River sockeye is complex, involving many different organizational units of the Department, the Pacific Salmon Commission, and the United States. Successful achievement of management objectives demands effective coordination and clear accountabilities. Concerns about roles and responsibilities require clarification. The report provides fourteen recommendations which are intended to address these concerns and guide future management of Fraser River sockeye.

The recommendations presented in Section 7 of the report are listed below.

Recommendation 1: Wild Salmon Policy

It is recommended that Fisheries and Oceans Canada conduct consultations on a wild salmon policy and associated guidelines, with First Nations, harvesters and other interest groups including conservation organizations, and the policy should be finalized by December 31, 2003. This policy will provide a framework for defining conservation objectives for naturally spawning salmon and will include direction for resource management (conservation units and reference points), habitat protection, enhancement and aquaculture.

Recommendation 2: Advisory Processes

It is recommended that new advisory processes be developed by the fall of 2003 for the provision of advice on policy issues and harvest planning to facilitate improved, transparent consultation:

- Policy Advisory Process - A new formal, structured policy advisory process is proposed. Specifically, a policy steering committee should be established that represents the full range of interests for the conservation and management of Pacific fisheries resources including First Nations, commercial and recreational fishing sectors, conservation organizations[1], community groups, and the provincial government. This committee would provide a venue for broadly based dialogue with the Department on major policy matters affecting the fishery, including a wild salmon policy, risk management, and socio-economic objectives. It would also provide

[1] There is a difference of opinion over whether this should refer to separate inclusion of environmental groups and stewardship/streamkeeper groups.

advice on the full range of interests that need to be consulted further and the best means of obtaining input on specific policy matters of concern.

- Assignment to Policy Advisory Process – Given that the conservation concerns associated with some mixed stock fisheries are likely to result in harvesting opportunities to more terminal areas, it is recommended that the policy steering committee, once established, should be asked to provide advice to clarify the policy on access and allocation. Consultation with affected parties should occur in the fall of 2003 to discuss issues, and provide information to support a policy decision before the 2004 salmon fishery.

- Harvest Planning - A more streamlined and representative cross-sectoral advisory process is proposed for harvest planning and post-season review. Specifically, two new salmon harvest planning committees, one each for the north and the south. A three-phased process would be established to provide co-ordinated advice to the Department on the development of IFMPs:

    1. Advice on conservation objectives and science-based risk management would be provided by representatives from First Nations, the recreational and commercial sectors, and conservation organizations[2].
    2. Harvesters (representatives from First Nations and the recreational and commercial fishing sectors) would develop proposals on the conduct of fisheries consistent with phase 1, for inclusion in draft IFMPs.
    3. First Nations, the recreational and commercial sectors, and conservation organizations[2] would provide advice on draft IFMPs focusing on ensuring consistency between conservation objectives and proposed fisheries, and on any cross-sector integration issues requiring resolution. As well, they would participate in post season review.

- Fraser Panel - The Fraser River Panel of the Pacific Salmon Commission will continue to serve as a focal point in the in-season management of Fraser River sockeye and pink.

Recommendation 3: Fraser River First Nations Watershed Process

It is recommended that the Fraser River First Nations Watershed process be further supported by ensuring technical support is provided for continued improvements in the efficiency of annual management planning and consultation processes.

Also, support should be provided to coastal First Nations who choose to form an aggregate body representing First Nation communities.

[2] There is a difference of opinion over whether this should refer to separate inclusion of environmental groups and habitat stewardship/stream keeper groups.

Recommendation 4: Elements of the IFMP

It is recommended that the pre-season development of the IFMP be the focal point for consultation and debate. IFMPs should clearly define the priority of conservation and should also include a number of other key items such as:

- A description of domestic and international commitments;
- Decision rules that will guide in-season management. This would include a science-based risk management framework, with decision tables that illustrate probable effects of a wide range of management options. They would cover a broad range of foreseeable circumstances and would guide the appropriate fisheries management responses to changing circumstances (such as in-season estimates of pre-spawning mortality of Late run sockeye); and
- A description of socio-economic objectives.

Recommendation 5: IFMP Issues for 2003

Pending completion of a wild salmon policy and completion of long-term escapement goals for Fraser River sockeye, it is recommended that consultations be held with First Nations and stakeholders (including conservation organizations) on escapement targets to guide resource management for the 2003 fishery. As well, there will be consultations on the management objectives for Cultus Lake and Sakinaw Lake sockeye in 2003, relating to both fishing and habitat protection, and other means of stock rebuilding.

Recommendation 6: Food, Social, and Ceremonial Obligations

All harvesting plans will continue to be designed to ensure that, after conservation objectives have been addressed, priority access for food, social and ceremonial (FSC) purposes is provided over other uses.

Recommendation 7: Regulation of the Recreational Fishery

It is recommended that consultations be initiated with the Sport Fishing Advisory Board to address concerns regarding the regulation of the recreational fishery, its linkage to the First Nations and commercial fisheries, and possible impediments to the provision of stable and predictable opportunities for the recreational harvest of sockeye.

Recommendation 8: Enforcement

It is recommended that the Department consult with First Nations and stakeholders on enforcement issues:

- There will be pre-season meetings involving Conservation and Protection staff from Area offices to address anticipated monitoring enforcement issues, coordinated strategies, and priorities.

- There will be post-season meetings to review the outcome of these strategies, and progress related to partnership arrangements and protocols.
- Partnership arrangements and protocols with First Nations and stakeholders should be developed or improved, wherever possible. These would formalize the shared roles and responsibilities, and could include improved monitoring and catch reporting, co-management issues, or on-ground interactions between the parties.

As well, external members of the Steering Committee advocate more funding to support enforcement activities related to the conduct of Fraser River sockeye fisheries.

Recommendation 9: Monitoring and Assessment Studies

It is recommended that monitoring and assessment studies be continued to improve understanding of the effects of high spawner density (e.g. Adams River 2002) and the migration behaviour and in-river mortality among Late run sockeye.

As well, external members of the Steering Committee advocate undertaking more extensive stock assessment studies on all Fraser River sockeye stocks.

Recommendation 10: In-Season Estimates and Data

It is recommended that the Department work with the staff of the Pacific Salmon Commission, First Nations and stakeholders to develop improved in-season estimates of run size and timing. A number of avenues will be explored to develop these improvements:

- improvements to existing test fisheries;
- development of new test fisheries;
- environmental monitoring programs;
- use of stock assessment fisheries (conducted on a limited small fleet basis);
- traditional knowledge and on-water information will be evaluated as a means of augmenting these information sources; and
- the Department should consider a three to five year program designed to optimize use of resources directed at in-season estimates required to achieve management objectives.

It is also recommended that the Department work with all harvesting groups to improve the accuracy and timeliness of catch reporting, including adoption of a catch monitoring system to provide information on landings.

Recommendation 11: Facilitating Stock Assessment Fishery

It is recommended that the trigger for a pilot sales fishery be clarified so that the occurrence of stock assessment fisheries (conducted on a limited small fleet basis) that are specifically for the determination of stock abundance and the identification of a Canadian total allowable catch (TAC), whether in approach areas or within the Fraser

River, would not automatically trigger a pilot sales fishery. Such an assessment fishery would need to be approved by the Fraser Panel, as part of the Pacific Salmon Commission process.

Recommendation 12: Improved Communication with Recreational Fishery

It is recommended that Pacific Region staff consult with the Sport Fishing Advisory Board prior to the commencement of the 2003 management season to identify and implement practical, affordable options that will improve the timeliness and effectiveness of in-season communication and consultation with the recreational fishing community.

Recommendation 13: Innovative Fisheries

It is recommended that the Department work with all sectors to adopt innovative means to conduct sustainable fisheries that are consistent with conservation objectives. Where appropriate, conservation organizations should be involved to assist in advising this work.

Recommendation 14: In-Season Decision Making

It is recommended that the Regional Director of Fisheries Management be assigned the authority and accountability for implementation of the IFMP including coordination between Area offices and dispute resolution, and for other circumstances that are not anticipated in the IFMP.

REVIEW OF THE 2002 FRASER RIVER SOCKEYE FISHERY

1. Introduction

In 2002, the abundance and the timing of some sockeye stocks returning to the Fraser River was dramatically different from pre-season forecasts. Controversy arose over the appropriate conservation measures for the resource, the management of the fishery, and the response of Fisheries and Oceans Canada (DFO) to those changed circumstances. The timeliness and accuracy of information, the process for decision making particularly in the face of uncertainty, and the consultation processes all came into question.

On September 6, 2002, at a meeting with commercial fishing interests, the Minister of Fisheries and Oceans asked that a post-season review of Fraser River sockeye fisheries be conducted to examine the concerns raised. Terms of reference for the review are included in Appendix 1. The intent of this review was to focus on Fraser River sockeye management with particular emphasis on conservation objectives, consultation processes, risk management, adequacy of data, decision-making processes, enforcement, and the management process of Fisheries and Oceans Canada. The objective was the development of recommendations to improve future management of Fraser River sockeye and the fisheries that depend on those stocks.

2. Process for the Review

The review was directed by the Assistant Deputy Minister of Fisheries Management, who chaired an External Steering Committee comprised of members from the Province of British Columbia, the Pacific Fisheries Resource Conservation Council, First Nations, commercial and recreational organizations, the Pacific Salmon Commission, a conservation organization (The Sierra Club), and the Regional Director General of Fisheries and Oceans Canada in the Pacific Region. Members of the External Steering Committee are listed in Appendix 2. The External Steering Committee contributed to the development of the terms of reference for the review. As well, Committee members co-ordinated consultations with their respective interest groups, reviewed progress during the consultation period, and participated in the review and production of the final report.

3. Overview of the 2002 Fisheries for Fraser Sockeye

3.1 The Issue

The issue to be addressed by this review was whether there was an opportunity to harvest more Summer and Late run sockeye based on the information that was available in-season. Members of some harvest sectors felt there was adequate evidence of very large runs and that Late run sockeye were holding in the Strait of Georgia. However, the critical question is whether the accountable managers had adequate information to justify such fisheries, given the expected risk to Late run sockeye stocks, including conservation of Cultus Lake sockeye. There was also substantial frustration concerning the process and timeliness for making management decisions when the harvest opportunities were thought to exist.

The background to this issue involves pre-season assumptions, significant changes in information during in-season assessments, and the post-season observations of very large spawning escapements

The pre-season expectation for 2002 Fraser River sockeye was for an average to below average return of Fraser River sockeye. Fisheries were expected to target on the Summer stock aggregate, avoiding the less abundant Early Stuart, Early Summer, and Late run stock aggregates. It was anticipated that the Late stock aggregate would continue to experience exceptionally high in-river pre-spawning mortality (90%) assumed value, based on recent year observations. As well, conservation concerns had been identified for Cultus sockeye, one component of the Late run. To provide limited fishing opportunity for the Summer run stocks, an exploitation rate limit of 15% on the Late run stock aggregate was established through the Fraser Panel of the Pacific Salmon Commission. However, the Fraser River management plan provided for additional harvest opportunities if there was sufficient abundance and Late run sockeye delayed four to six weeks in the Strait of Georgia, consistent with their historical migration patterns.

When commercial fishing commenced in late July, sockeye were abundant and Late run sockeye were already detected returning to the Fraser River. This was the earliest return of Late run sockeye ever recorded. The 15% exploitation rate limit for Late run sockeye was reported as being met on August 8. An adjustment to the implementation of the 15% limit was adopted on August 9 based on excluding the catch of Late run sockeye in the Fraser River up to August 17. This exclusion was based on the assumption that Late run sockeye in the river before that date would suffer a 100% mortality. The adjustment on August 9 allowed additional fishing opportunities from August 10 to 14. This additional harvest opportunity did not, however, allow for exploitation of Summer run sockeye at levels they could support. Moreover, throughout August there were major upgrades to the estimated abundance of the Late run and commercial harvesters questioned whether the 15% exploitation limit was still necessary. While there was evidence that some portion of the Late run stocks were not migrating immediately into the Fraser River, there was no

information on how long they would continue their delay, or what mortality rate would prevail once they entered the river. What was known, however, was that there were considerably more fish than predicted, and that given the delay, which was greater than had been experienced the previous three years, it could be expected that the mortality of Lates could be less than planned preseason. However, concerns for the Cultus Late sockeye population remained.

In late August, some additional fishing opportunities were provided based on a significantly increased in-season estimate of abundance. These fisheries were then consistent with the exploitation rate limit for Late runs. By September 1, conservation concerns for upper Fraser River (Thompson River) coho came into play and further sockeye fishing opportunities were not feasible. Subsequent assessments of spawning escapements to the Summer and up-river Late run stocks indicated very large spawning escapements and much lower pre-spawn mortalities than expected in the pre-season.

3.2 The Legal and Policy Context of the Integrated Fisheries Management Plan

Objective strategies for the conservation and management of Fraser sockeye in 2002 were set out in the annual Integrated Fisheries Management Plan (IFMP) for Pacific Salmon in Southern British Columbia. The plan, which was announced on May 17, 2002, reflects the Department's obligations to ensure conservation of fishery resources and to provide for food, social and ceremonial fisheries by First Nations. As well, it is based on a broad array of policies related to Pacific salmon, including *A New Direction for Canada's Pacific Salmon Fisheries*, *An Allocation Policy for Pacific Salmon*, and *A Policy for Selective Fishing in Canada's Pacific Fisheries.* The following are the principles that pertained to the conduct of 2002 Fraser River sockeye fisheries:

- Conservation of Pacific salmon stocks is the primary objective and will take precedence in managing the resource (New Direction Principle 1).
- A precautionary approach to fisheries management will be maintained (New Direction Principle 2).
- After conservation, First Nations' food, social and ceremonial requirements and treaty obligations to First Nations have first priority in salmon allocation (Allocation Principle 2).
- After conservation needs are met, and priority access for First Nations… is addressed, recreational anglers will be provided…predictable and stable fishing opportunities for sockeye, pink and chum salmon (Allocation Principle 4).
- After conservation and First Nation obligations are met, the commercial sector will be allocated at least 95% of the combined commercial and recreational catch of sockeye, pink, and chum salmon (Allocation Principle 5).
- One of the fundamental strategies of fishing selectively is the avoidance of non-target species and stocks through time and area restrictions (from Selective Fishing Principle 4).

3.3 Consultations

In the development of the IFMP, Fisheries and Oceans Canada consulted separately with each of the harvesting sectors during the winter of 2001 and the spring of 2002. The Department conducted approximately 50 meetings with First Nations, six meetings with recreational fishing groups, and nine meetings with commercial salmon licence groups in southern British Columbia. As well, some key issues related to Fraser River sockeye were handled through the Pacific Salmon Commission and the Fraser Panel, which provide another venue for advisor input.

In general, information was provided on stock forecasts, escapement goals, stocks of concern, and potential fishing opportunities within the context of decision rules that guide the in-season conduct of fisheries.

3.4 Roles and Responsibilities

Some in-season management responsibilities for Fraser River sockeye are shared between Canada, the United States, and the Pacific Salmon Commission, in accordance with the Pacific Salmon Treaty. Fraser River sockeye and pink salmon are the only B.C. salmon stocks in which this joint authority has been established for in-season management. The following table sets out the roles and responsibilities of these three agencies.

Table 1: Roles and Responsibilities for the Management of Fraser River Sockeye (and Pink) Salmon

In-Season		
Pacific Salmon Commission Secretariat	**Fraser River Panel Canadian Section/DFO**	**Fraser River Panel U.S. Section**
1. Test fishing in Panel Waters	1. Test fishing in non-Panel Waters	1. Catch monitoring
2. Biological sampling in Panel Waters	2. Biological sampling	2. Consultations with affected harvest interests
3. Catch monitoring in Panel Waters	3. Catch monitoring	3. Decisions to open or close Panel Water fisheries (joint decision with Canada)
4. Recommendations to the Fraser River Panel regarding adoption of run size, by stock group	4. Monitoring the in-river migration environment	
5. Report on the progress of escapement into the Fraser River	5. Monitoring the progress of escapement onto the spawning grounds	
6. Recommendations to the Fraser River Panel for Total Allowable Catch (TAC) and TAC catch shares	6. Consultations with affected harvest interests	
7. Recommendations to the Fraser River Panel for commercial fisheries to attain TAC shares	7. Decisions to open and close fisheries in non-Panel Waters in a manner consistent with agreed management objectives	
8. News releases	8. Decisions to open or close Panel Water fisheries (joint decision with the U.S.)	
Post Season		
Pacific Salmon Commission Secretariat	**Fraser River Panel Canadian Section/DFO**	**Fraser River Panel U.S. Section**
1. Recommendations to the Fraser River Panel regarding the adoption of final run size estimate	1. Final spawner escapement estimates	1. Final catch data
2. Report on Fraser River Panel activities and the achievement of objectives	2. Final catch data	
3. Recommendations to the Fraser River Panel for future management and monitoring improvements	3. Reports on sockeye and pink salmon research	
	4. Review the season with interested parties	

Procedures for the Fraser River Panel stipulate that the respective national sections of the Panel will develop proposed regulations for their domestic Panel Water fisheries consistent with recommendations and projections provided by the Pacific Salmon Commission (PSC) staff, or as may be modified by bilateral agreement. If proposed

fishery regulations are consistent with PSC assessments, the Fraser River Panel will adopt the Panel Water fishery recommendations. If the PSC staff advises that a Panel Water fishery proposal is inconsistent with PSC assessments, national section may modify and re-submit its proposal.

A more specific description listing of the roles and responsibilities within the Department, as they pertain to the management of Fraser sockeye, is shown below.

Table 2: DFO Roles and Responsibilities

DFO Position	Responsibilities
Regional Director General	• Provides guidelines for broad policy implementation. • Chairs the Regional Management Executive Committee (RMEC) which receives science advice from the Pacific Scientific Advice Review Committee (PSARC). • Approves objectives for IFMP development on behalf of Region. • Approves IFMP on behalf of Region, for subsequent submission to the Minister. • Provides final in-season decisions within the Region. • Approves variation orders for First Nations and recreational salmon fisheries.
Fisheries Management Branch	• Leads process of allocating financial and personnel resources to ensure appropriate approaches to resource management and enforcement throughout the Region. • Pre-season: Identifies options for development of broad objectives for IFMP development; ensures cross-sector (branches and Areas) input into development of broad objectives for IFMP. Reviews pre-season implementation plans to ensure consistency with IFMP and between Areas. Directs consultation on issues of regional application (allocation implementation). Co-ordinates the annual enforcement priority setting and sets the long-term strategic direction for enforcement. • In-season: Clarifies policy direction and leads process to address cross-Area issues that arise. Regularly reviews fishery decisions where issues may be raised to ensure consistency with policy, IFMP, and internal Departmental processes. Provides policy advice related to fishery decision options under consideration. Monitors compliance with strategic enforcement direction and success of implementation of enforcement strategies. Approves variation orders for commercial salmon fisheries. • Post-season: Co-ordinate post season reviews to assess whether objectives of the IFMP have been met. Assess success of overall enforcement program, and provide direction on changes for the coming year.

Science Branch	• Lead process of allocating financial and personnel resources to ensure appropriate approaches to stock assessment and research throughout Pacific Region. • Provide pre-season forecasts of abundance, timing, and diversion rates. • Review forecasts and assessment methodologies through PSARC. • Review and provide advice on options for exploitation rates and escapement targets. • Implementation of research projects. • Establish guidelines and standards for stock assessment.
Areas	• Allocate resources within the Area to undertake fishery management, enforcement and stock assessment activities according to regional and Area priorities. • Pre-season: Participate in identification of objectives for IFMP development. Contribute to draft IFMP and lead consultations with First Nations and stakeholders on IFMP development, and pre-season enforcement and management planning. Provide pre-season forecasts. Provide input into enforcement priority setting. • In-season: Implementation of the IFMP, including input into and review of fishery management decisions to address Area considerations. Collect catch information and any other information required to make fishery decisions; collect escapement and biological data. Implement operational enforcement plans consistent with regional and area priorities. Lead in-season consultations with First Nations and stakeholders. Make decisions regarding local fisheries; participate in decision making for fisheries of regional scope. • Post-season: Conduct post-season assessments of IFMP and enforcement plans. Lead post-season consultations with First Nations and stakeholders. Conduct escapement analyses and fishery assessment reviews.
Chair, Fraser Panel	• Pre-season: Co-ordinates the development of Canada's position regarding Fraser sockeye and pink salmon fisheries and negotiates arrangements with the US. Develops fishing plan options consistent with the IFMP and the negotiated arrangements for consideration by Director, Fisheries Management. • In-season: Develops fishing plans consistent with the IFMP and the Pacific Salmon Treaty; reviews fishing plans within Fisheries Management Branch. Co-ordinates in-season Fraser Panel process and co-ordinates management of Fraser River sockeye and pink fisheries with regional and international activities. Unresolved issues are referred to Director Resource Management –Program Delivery • Post-Season: Participates in post-season reviews and prepares reports to the PSC and US.

3.5 Pre-Season Expectations

Fraser River sockeye are the focus of most First Nations and commercial fisheries in southern British Columbia, and an important contributor to recreational fisheries. Since the mid 1990s, these runs have experienced lower than expected returns due in large part to poor ocean survival and adverse freshwater environmental conditions, which have had a serious impact on fishing opportunities. For Fraser sockeye stocks returning in 2002, the forecast total abundance was below average for this cycle. Concerns for the Early Stuart, Early Summer and Late run stock aggregates resulted in pre-season plans which focused most fisheries on the Summer run sockeye aggregate returning from late July until mid August. The Early Stuart and Early Summer runs, which return before the Summer run, were forecast at low abundance levels, and exceptional problems related to the Late run, which normally returns after the Summer run demanded precautionary management.

Prior to the start of the fishing season, the forecast total abundance of Fraser sockeye for 2002 was in the range of 7.9 to 13.4 million fish (Table 3).

Table 3: 2002 Fraser River Sockeye Forecast

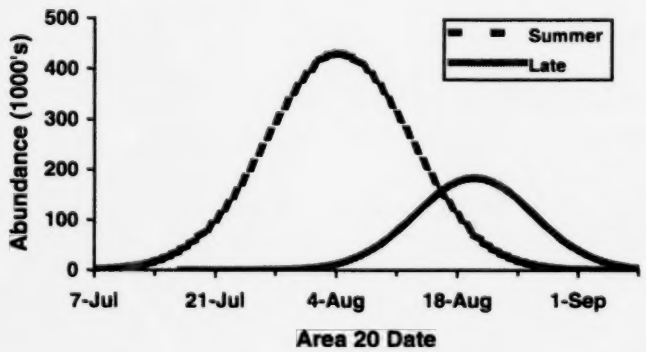
System	Return at 50% Probability*	Return at 75% Probability*
Early Stuart	105,000	59,000
Early Summer	678,000	326,000
Summer	9,006,000	5,204,000
Late**	3,578,000	2,322,000
Total Fraser	13,367,000	7,911,000

* Probability that the actual return will reach or exceed forecast levels

** Includes Birkenhead and late Lates

Figure 1: Pre-Season Forecast of Migration Timing for the Summer and Late Run

Pre-Season Expected Return Migration Timing for Summer and Late Run Sockeye
based on the 50% probability estimate of abundance



Based on historic performance (Figure 1), it was anticipated that there would be a separation in the return migration timing of the Summer and Late runs, through Area 20, of 16 days, with the peak return date for Summer run expected to be August 4, and the peak date for the Late run to be August 20. (A map of fishery management areas is shown in Appendix 3.) This run timing separation would have provided reasonable harvest opportunities targeted on the Summer run without major impact on the Late run.

Normally, prior to 1996, the Late run delayed in marine areas for four to six weeks before entering the river, whereas the Summer run tends to migrate directly into the river. This resulted in an even greater separation in the migration timing of Summer and Late run sockeye within the Fraser River.

3.6 Conservation and Management Goals

Escapement goals are set annually for the four major run components of Fraser River sockeye, with a long-term objective of increasing Fraser sockeye returns. The interim escapement goals (shown below in Table 4) were established in 1987 to reflect long-term potential production. Currently, the process and objectives for determining Fraser River sockeye escapement goals are under review.

Table 4: Fraser River Sockeye Escapement

System	2002 Escapement Goal @ 50% Probability*	2002 Escapement Goal @ 75% Probability*	Interim Escapement Goal**	Average Cycle Escapement
Early Stuart	75,000	59,000	200,000	37,300
Early Summer	227,000	227,000	399,000	139,400
Summer	3,200,000	1,900,000	3,600,000	618,000
Late***	2,900,000	2,000,000	4,100,000	2,148,500
Total Fraser	6,402,000	4,186,000	8,299,000	2,943,200

* Probability that the actual return will reach or exceed forecast levels

** Currently under review

*** Includes Birkenhead and late Lates

In 2002, the Southern B.C. IFMP for Pacific salmon adopted a maximum exploitation rate of 15% for Late run sockeye, not including Birkenhead, as a key conservation objective. The IFMP also included decision rules with harvest rates for Fraser River sockeye. These decision rules were set out in a table with harvest rate ranges and potential catches, by stock aggregate and run size (Appendix 4). The stepped formulation of harvest rates is different for each stock aggregate. The table stipulates harvest rates of 0-15% for the Late run at abundance levels below 2.1 million, and states that due to the expected high in-river mortality of Late run sockeye, no directed fisheries on Lates were anticipated, unless stocks delayed four to six weeks in the Strait of Georgia before entering the river. Controversy arose over the circumstances (in terms of timing and proportion of the run) that would be sufficient to allow for adjustment of the 15% exploitation rate limit.

3.7 Specific Management Concerns

3.7.1 Early Stuart and Early Summer Run Sockeye

The forecast return of Early Stuart sockeye was in the range of 59,000 to 105,000 fish, with corresponding escapement targets of 59,000 to 75,000. At any run size less than 75,000, it was anticipated that there would be very restricted opportunities (for First Nations only) to harvest Early Stuart sockeye and that First Nation food, social and ceremonial fisheries would have to be restricted.

For Early Summers, the forecast of 326,000 to 678,000 was lower than average for this cycle (735,000 for 1980-2000). Therefore delays and reductions in fishery openings were identified as a possibility in order to meet an escapement target of 227,000.

The implication in terms of fishery management was that fishing effort would be delayed to avoid major impact on the early timing Fraser River sockeye runs, and would focus on the Summer run, forecast at 5.2 to 9.0 million fish. (The 1980-2000 average run size for the Summer run was 5,283,000.)

3.7.2 Late Run Sockeye

The unexplained early entry of Late run sockeye stocks into the Fraser River since 1995 has led to a major conservation concern. Prior to 1995, Late run sockeye typically delayed in the Strait of Georgia and off the mouth of the Fraser River for up to six weeks before continuing their upstream migration into the Fraser River. While the cause of the changed migration behaviour is unclear, the early entry to the Fraser River and prolonged period before spawning has contributed to high pre-spawning mortality rates thought to be associated with a parasitic infection (*Parvicapsula minibicornis*) that causes kidney failure. Mortality rates of anywhere from 40% to more than 90% for some stock components of the Late run have been observed since the mid 1990s. Research continues in a variety of fields to improve understanding of this phenomenon.

It was expected that the high levels of pre-spawning mortality that have occurred in recent years (in the order of 90%) would continue. The management regime for Late run sockeye was based on a reduction in the total (Canada and U.S.) exploitation rate on Late run sockeye from 17% in 2001, to 15% in 2002. This was agreed as part of the Pacific Salmon Commission process and reflected the need for conservation based on the severity of the in-river mortality problem in recent years and an assumption that in-river mortality rates would remain high in 2002. The 15% exploitation rate limit for Late run sockeye was not the result of a specific quantitative risk assessment. It was part of a package of arrangements negotiated with the U.S. on Pacific salmon that reflected the need to address a critical problem. With an expected abundance of Late run sockeye in the range of 2.3 to 3.6 million fish, a 90% in-river mortality rate implies that spawning escapements would be no more than 230,000 to 360,000. The severity of this

problem is highlighted in the context of escapement goals that ranged from 2.0 to 2.9 million fish.

The 2002 management plan was developed with the expectation that the Late run would enter the Fraser River about four weeks earlier than normal resulting in substantial overlap with the migration timing of the healthy Summer run within the Fraser River. Given the migration overlap between Late and Summer run sockeye, harvesting opportunities past the middle of August would be limited. With the concerns for Early Stuart and Early Summer sockeye, the window of opportunity to harvest Summer run sockeye was expected to be quite limited.

3.7.3 Other Stocks of Concern

The IFMP also identified several other conservation constraints for stocks of concern that may have been caught incidentally to the harvest of Fraser River sockeye.

- Nimpkish River sockeye are present in the fishing area in Queen Charlotte Sound and Queen Charlotte Strait. Time and area closures were anticipated pre-season to protect these stocks.

- Cultus Lake sockeye (a stock in the Late run group) were identified as a conservation concern and a potential candidate for listing by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), due to declining abundance over the last decade.

- The management plan called for no increase in harvest impacts on early timed Fraser River chinook, which are harvested in the north coast, the West Coast of Vancouver Island, Juan de Fuca Strait, and in the Fraser River.

- Steelhead from the Fraser River interior were identified as a concern.

- B.C. Interior coho (Thompson River) have been the subject of extensive conservation measures since 1998. These stocks are encountered at various times in all fisheries in southern B.C. waters, from May to September. One of the major impacts is the closure of commercial, recreational, and First Nations sockeye fisheries (in the Fraser River, Strait of Georgia, and Juan de Fuca Strait) from early September to mid-October. These stocks were listed as endangered by COSEWIC in May of 2002.

- Inshore rockfish are encountered by troll gear and some net gear in all coastal waters. Work is ongoing to identify important habitat areas and develop conservation plans for rockfish.

3.8 Enforcement Planning

For 2002, the Department changed its enforcement strategy from the traditional approach with general patrols to a new approach where enforcement coverage was prioritized to cover activities that have demonstrated non-compliance. This directed some staff away from activities such as open fisheries, where the compliance has been historically high, to closed times, and those fisheries and activities with low compliance, such as habitat impacts from urban development. This targeted approach, which is consistent with the approach of other enforcement agencies, will continue in future years. As well, contingencies for potential protest fisheries were developed in conjunction with the RCMP.

To improve the safety to Fishery Officers and the participants in pilot sales fisheries, the Department encouraged the use of enforcement protocols. There was also a protocol by the Department, the RCMP, and the British Columbia Aboriginal Fisheries Commission to assist in the development of safe pilot sales fisheries.

The Department is also pursuing restorative justice initiatives in both the upper and lower Fraser River, consistent with the community justice systems being developed with the Esketemc and Seabird Island First Nations. These are intended to provide alternatives to the traditional court process and thereby improve overall compliance by bringing the community in to the process of sentencing.

3.9 In-Season Conduct of the Fishery

During late June and early July in-season stock identification suggested that the Early Stuart sockeye stocks were returning at levels close to the 75% probability forecast of 59,000. Consistent with the pre-season plan, there were no directed commercial or recreational fisheries on Early Stuart stocks and First Nations fisheries were restricted to limited ceremonial licences for very small numbers of fish. For the Early Summer aggregate, information in mid to late July suggested the early component of this stock group was relatively weak while the later component was larger than expected.

By the third week of July, both Summer run and Late run sockeye were arriving in the approach waters to the Fraser River (Table 5). The first of the Late run sockeye were observed entering the Fraser River during the week of July 21, two weeks earlier than the previous year, and a full six weeks earlier than the historic average (Figure 2). This resulted in a significant overlap in the migration timing of Late run and Summer run sockeye. The very early return of Late run sockeye supported the expectation of high in-river mortality. Scientific data available at the time suggested that pre-spawn mortalities could reach, and possibly exceed, 90% associated with this early entry into the river.

On August 2, it was projected that the 15% exploitation rate limit on Late run sockeye would be met the following week, and on August 8 it was announced that the limit had been reached, based on the 50% forecast run size of 2.9 million. Then on August

9, additional fishing opportunities were announced based on an adjustment to the 15% limit and an increase in the estimated abundance of the Late run. Through the Fraser River Panel, it was agreed bilaterally with the U.S. that the 15% limit would not apply to fish caught in the Fraser River up to and including August 17, based on the expectation that these early entry fish would suffer extremely high mortality rates. It was anticipated that the exclusion of these catches would have a minimal impact on the number of effective spawners and only a small impact on the exploitation rate.

Throughout August, the in-season estimates of abundance of Summer and Late run sockeye were adjusted several times, and as increases were adopted, fishing opportunities were also adjusted accordingly. During this time, commercial harvesters repeatedly expressed the view that returns were greater than the official estimate and that the announcement of run upgrades was slow.

In the course of the review, one of the questions related to foregone catch in the commercial fishery as a result of management decisions in 2002. Specifically, it was asked if the total catch could have been increased by authorizing additional fisheries in the Fraser River throughout August rather than authorizing additional fisheries in Johnstone and Juan de Fuca straits. This strategy would take advantage of lower Late run proportions in the Fraser River in contrast to the approach area fisheries. This could have resulted in increasing the numbers of Summer run sockeye that could have been harvested while not exceeding the 15% harvest rate ceiling on Late run stocks. However, this strategy would also result in a severe imbalance in the distribution of allocation of catch and fishing opportunities. For example the Area E (Fraser River gillnet) catch would have been significantly greater than the 45.0% of the actual total commercial catch and its pre-season target allocation of 28.5%. In addition, the fishing opportunities in Johnstone and Juan de Fuca straits would have been minimal. The IFMP did not provide policy guidance nor was there industry consensus that indicated that maximizing Canadian catch would take priority over balancing commercial gear sector allocation. There was also no consensus amongst the commercial fleet representatives to change to alternative fishing scenarios to maximize Canadian catch due to impacts on allocation. As a result of no industry consensus, the Department chose to balance commercial sector allocations instead of maximizing Canadian commercial catch. The future IFMPs will need to deal with this policy issue explicitly in order to provide clear direction for future circumstances.

The recreational sector found the ongoing uncertainty regarding potential fishing opportunities very problematic.

In the face of great uncertainty regarding several critical parameters, including migration timing, estimated abundance, rate of diversion through Johnstone Strait, and in-river pre-spawning mortality, fisheries managers took a precautionary approach, as prescribed in policy and legislation. The adjustment to the implementation of the 15% harvest rate limit for Late run sockeye was made in response to a large change in the abundance of the Late run stocks along with some evidence of some Late run sockeye holding in the Strait of Georgia. Although there

was evidence that Late run sockeye were holding in the Strait, there was no way of determining how long they would continue to hold or what the in-river mortality rate would be once they did enter the river.

By late September, it was estimated that there were only five days between the peak return dates to Area 20 of the Summer run and Late run, compared to the pre-season expectation of 16 days. The effect of this was virtually no time or location when the Summer run could be harvested without coincident harvest of the Late run.

Table 5: In-Season Key Dates (Detailed chronology in Appendix 5)

In-Season Key Dates
• June 24: Area 20 test fishing started
• Week of July 21: Lates identified in the Fraser River, 2 weeks earlier than in 2001 and 6 weeks earlier than normal, leading to expectation of very high mortalities
• July 19: FSC fisheries started
• July 27-August 6: commercial fishing
• July 29: marine recreational fisheries started
• August 2: in–river recreational fisheries started
• August 2: 15% limit for Lates expected to be reached in the following week
• August 8: 15% limit for Lates reported as being met
• August 9: Summers estimated at 8 million and Lates at 4.3 million; additional openings announced based on abundance of Lates and an adjustment to the 15% limit on Lates
• August 10-14: commercial fishing
• August 12: Summers estimated at 7 million; and Lates at 4 million
• August 16: Lates estimated at 5.5 million
• August 23: Summers estimated at 6 million and Lates at 5.8 million
• August 27: Summers estimated at 6.7 million and Lates at 6.5 million, allowing for more fishing within the context of the existing 15% limit on Lates
• August 28-30: First Nations, recreational and limited commercial fishing
• September 1: Thompson coho concerns guide fishery decisions in marine areas and lower Fraser River
• September 17: Summers estimated at 6.8 million and Lates at 7.5 million

3.10 Post-Season Performance

3.10.1 Catches and Exploitation Rate of Fraser River Sockeye

The experience of the various harvest groups was significantly different in terms of their catches of Fraser River sockeye. Aboriginal food, social and ceremonial (FSC) catches were largely as expected pre-season, with some higher than expected, while others did not meet FSC needs. In the Nechako and Stuart Lake areas, there has been an ongoing problem with variable sockeye returns. The

overall FSC catch of Fraser River sockeye was estimated to be 1,015,000 fish, compared to a pre-season expectation of 950,000 fish. Commercial catch estimates were below expected levels at 2.3 million fish. The recreational fishery catch estimate is 127,800 Fraser River sockeye, which was more than anticipated pre-season.

Table 6: Canadian and U.S. Catches of Fraser River Sockeye

Canadian Food, Social and Ceremonial Catch

	Southern Marine Areas*	In-River	Total
Expected Catch	250K	700K	950K
Actual Catch	274K	750.6K	1,024.6K

*South of Cape Caution includes 10,000 catch for Northern First Nations in Johnstone Straight

Canadian Commercial Catch and Allocation

	Seine B	Gillnet D	Gillnet E	Troll G	Troll H	Total BDEGH	Pilot Sales	Total Commercial
Expected Catch***	1,619K	634K	1,247K	350K	525K	4,375K		
% Share	37%	14.5%	28.5%	8.0%	12.0%	100%	*	
Actual Catch	681K	236K	948K	124K	119K	2,108K	120K	2,303K**
Actual %	32.3%	11.2%	45.0%	5.9%	5.6%	100%	*	

* Pilot sales fisheries are commercial fisheries, but they are not considered part of the commercial gear-area allocation. Therefore, percentage shares are not included.

** Includes 75,000 selective fishing catch

*** Based on 50% probability forecast

Canadian Recreational Catch

Catch	127.8K*

* During pre-season consultations, a catch of 50,000 Fraser River sockeye was identified for modeling purposes, but this was neither a target nor an allocation.

U.S. Catch

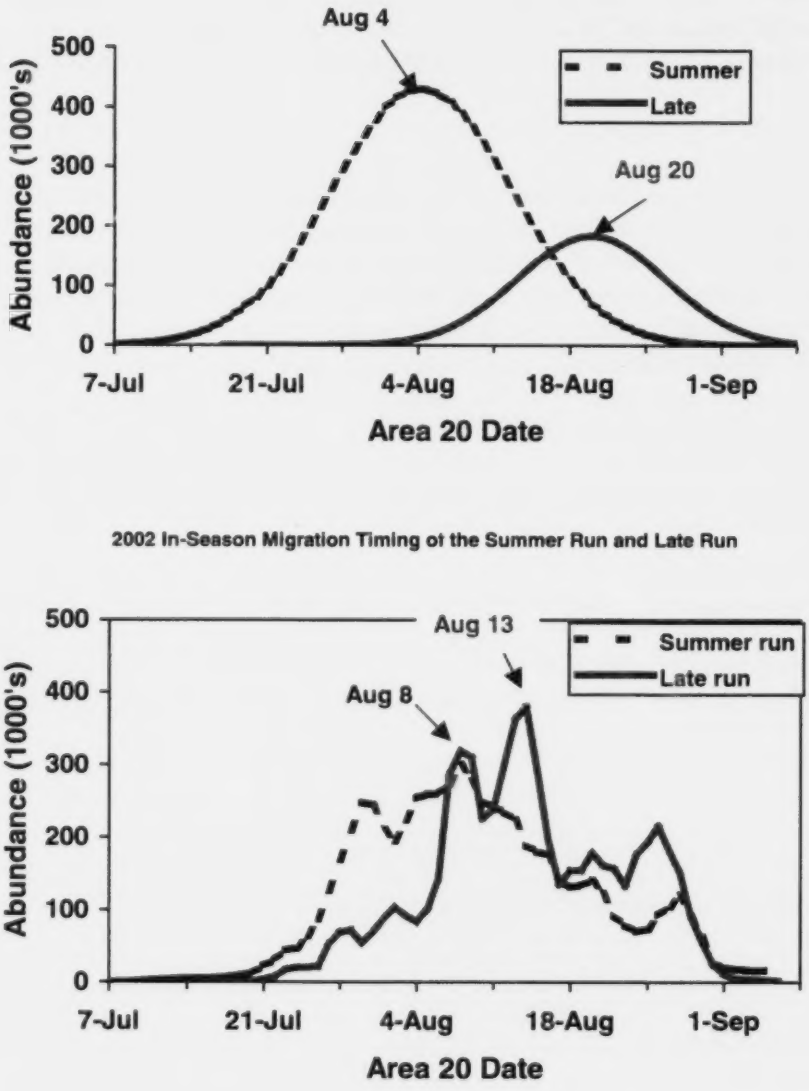
	Ceremonial and Subsistence	Commercial	Total
Catch	15.4K	434.6K	450.0K

3.10.2 Migration Timing of Summer and Late Run Fraser River Sockeye

The pre-season forecast of migration timing of Summer and Late run sockeye indicated 16 days between their respective peak return dates to Area 20, August 4 for Summers versus August 20 for Lates (Figure 2). In fact, there was an almost total overlap in the return migration of Summers and Lates, with both starting

their return migration into the Fraser River in the third week of July. This was a record early return - at six weeks earlier than the historic return migration of the Late run sockeye.

Figure 2: Migration Timing of Summer and Late Sockeye in Area 20



Consequently, the difference in the peak return to Area 20 was only five days, with the Summer run peaking on August 8, and the Late run peaking on August 13. That left virtually no time when healthier Summer run sockeye could be harvested without some impact on the Late run.

As the season progressed, however, there was evidence that while some Late run sockeye had returned to the river exceptionally early, a portion of the run remained in marine areas.

In aggregate, the additional fisheries that were permitted resulted in a total exploitation rate of 16.7% on the Late sockeye stock aggregate. The calculated rate excluding sockeye caught in-river before August 17 was 12.8%.

3.10.3 Fraser Sockeye Run Size

Early Stuart sockeye returned at low abundance, as expected. The Early Summer run was greater than forecast, at 880,000 sockeye, but not sufficiently large to enable the Panel to make significant changes to the conduct of fisheries. The abundance of the Summer run was 6.8 million, consistent with the forecast range. However, it was the Late run that was a dramatically different from the pre-season forecast. At 7.8 million fish, the Late run was two to three times larger than the forecast, which gave rise to intense pressure to revise the exploitation rate and provide more fishing opportunities.

Table 7: Pre-Season Forecast and Final In-Season Estimates of Fraser Sockeye Abundance

System	50% Forecast*	75% Forecast*	Final In-Season Estimate
Early Stuart	105,000	59,000	62,000
Early Summer	678,000	326,000	880,000
Summer	9,006,000	5,204,000	6,800,000
Late	3,578,000	2,322,000	7,800,000
Total	13,367,000	7,911,000	15,542,000

* probability that the actual return will reach or exceed the forecast levels

3.10.4 In-River and Pre-Spawning Mortality

By the beginning of September, marine fisheries for Fraser River sockeye were over and most Summer and Late run sockeye had moved into the Fraser River. As a result of the delayed entry into the river demonstrated by a significant proportion of the Late run sockeye, pre-spawn mortality rates were anticipated to be well below pre-season expectations. (In 2002, it was observed that sockeye were milling in the lower river, and some fish passed the Mission hydro-acoustic counting site more than once. Accordingly, estimates of returning Late run sockeye were adjusted to avoid overestimating the number of Late run sockeye,

and to address possible bias of in-river mortality.) Based on preliminary results from the radio telemetry study conducted in 2002, the mortality rate between the marine tagging locations and spawning tributaries for Late run stocks was approximately 20%. This estimate includes fish harvested in in-river fisheries and fish that perished; therefore, the in-river mortality rate due to natural causes would be less than 20% but final estimates are not currently available. Very preliminary results from the Thompson River disc tagging program suggest that there was a significantly higher pre-spawn mortality rate associated with the first ten days of passage of Late run fish into the Thompson system than later arriving fish. A final report on this project is anticipated in April 2003.

3.10.5 Fraser Sockeye Escapement

The preliminary spawning escapement estimate for Early Stuart sockeye is 24,000, compared to the Pacific Salmon Commission run size projection of 62,000 (at Mission). This discrepancy raises questions, suggesting there may have been en-route mortality between Mission and the spawning grounds, unaccounted in-river catch, or bias in either of the estimates. In any case, it appears that the escapement is well below (approximately one third) the goal of 75,000 for Early Stuart sockeye, and also below the average escapement of 37,000 for this cycle.

The preliminary spawning escapement estimate for the Early Summer stock aggregate totals 462,000, of which approximately 350,000 were enumerated in the North and South Thompson spawning tributaries. This is above the 2002 escapement goal of 227,000 Early Summer sockeye. Within the Early Summer stock aggregate, there were two areas of low returns: the Nechako and Seton-Anderson. The in-season run size projection from the Pacific Salmon Commission for the Early Summer stocks (from the Mission hydro-acoustic program) of 620,000 includes fish which would be harvested by First Nations and anglers. The in-river catch of Early Summer sockeye has not yet been finalized.

The in-season spawning escapement goals for both Summer run and Late run sockeye were exceeded, due to the larger than expected abundance of Late run sockeye and harvest restrictions. For the Summer stock aggregate, the final in-season estimate from Mission of 4,740,900 significantly exceeded the in-season escapement goal of 2,448,000. The final in-season estimate at Mission of 6,582,700 Lates also exceeded expectations based on the pre-season strategy reflecting the expectation of continued early river entry timing and associated en route and pre-spawning mortality. Accordingly, the Late run escapement strategy called for significantly reduced fishery impacts from historic levels to 15% exploitation rate unless there was evidence in-season that the Late run stocks were behaving normally.

The final in-season estimates for Fraser River sockeye stocks reflect the PSC generated hydro-acoustic estimates at Mission. They will differ from the

preliminary spawning ground estimates due to en route mortality, un-reported catches, reported catches, un-surveyed spawning populations and any un-measured bias in the hydro-acoustic estimates.

The preliminary spawning ground escapement estimate for the Summer run aggregate of 1,825,000 does not include an estimate for the Horsefly River, and Quesnel Lake and tributaries, other than the Mitchell River, as these populations were not enumerated. For the Late run aggregate, the preliminary spawning ground estimate of 5,486,700 does not include an estimate of en-route mortality associated with the early entry behaviour demonstrated by a yet to be quantified component of the return.

3.10.6 Enforcement Actions

Protests by commercial harvesters in Johnstone Strait in 2002 resulted in 40 charges being laid. Another 127 charges were laid arising from protests by commercial harvesters in the lower Fraser River. Eight charges were laid in conjunction with Aboriginal fisheries in the Fraser River. As well, some further charges are pending further investigation.

3.10.7 Overall Management

The 2002 fishery for Fraser River sockeye posed a challenge to in-season managers. The early part of the season proceeded substantially as forecast. Some First Nations dependent on these stocks were not able to meet identified requirements for food, social and ceremonial catch and they remain very concerned about future prospects and the need to rebuild these stocks. Strict harvest limitations have been in place for many years to protect early returning Fraser stocks, and it appears that other factors, such as marine and freshwater survival, are the main problem.

The timing, abundance, and the level of in-river mortality of Late run sockeye departed significantly from expectations. From an abundance and conservation perspective, the events of 2002 are a dramatic improvement for Late run sockeye over recent years. However, these events underscore the very high level of uncertainty associated with predicting migration timing, abundance and in-river mortality, and focuses directly on the question of risk and how it should be managed in the context of the fishery.

In the face of these challenges, managers consistently sought to operate in a precautionary manner within the structure of the decision rules. The overlap in timing of the Summer and Late run stocks made it impossible to harvest the available Summers and meet the management and conservation requirements for the Late run. The results show that the exploitation rate for Lates, which was 12.8% excluding those fish caught which entered the Fraser River before August

17, was consistent with the revised goal that was adopted in-season. The total exploitation rate of Late runs sockeye was 16.7%.

The escapements, which are an important measure of conservation and management success, were well above target levels for Early Summer, Summer and Late run stock aggregates. This was due to greater than expected abundance and restrictions on harvest. For Lates, reduced in-river mortality also contributed to higher escapements. However, there are still conservation concerns for smaller components of the Late run aggregate. At issue is the appropriate determination of stock components for conservation and management purposes, and the extent to which restrictions are required.

For harvesting interests, over escapement represents foregone harvesting opportunities and economic potential. Some fishers also question whether there will be a negative impact on future production due to reduced spawning productivity. The impact of "overspawning", or spawning in excess of target levels, is controversial and it is not well understood.

4. Context for the Review

This examination of the management of sockeye salmon in the Fraser River is being conducted against the immediate backdrop of the 2002 fishing season, which was marked by a high degree of controversy and conflict. It is also shaped by a public context that reflects the difficulties encountered over the past decade in managing salmon fisheries in British Columbia. Some of the factors that make up this context are summarized below.

4.1 Overview on Resource Status

Historically, the Fraser River system probably supported the largest total population of sockeye salmon *(Oncorhynchus nerka)* in the world (Northcote and Larkin 1989). Sockeye consistently spawn in hundreds of natal areas distributed throughout the accessible portion of the Fraser system. These represent a diversity of habitats including small streams, large rivers, and lakes. Several studies using various genetic stock identification techniques have examined population structure in the Fraser River and have consistently revealed high genetic diversity among populations. Populations that share the same lake-rearing environment tend to be relatively similar genetically.

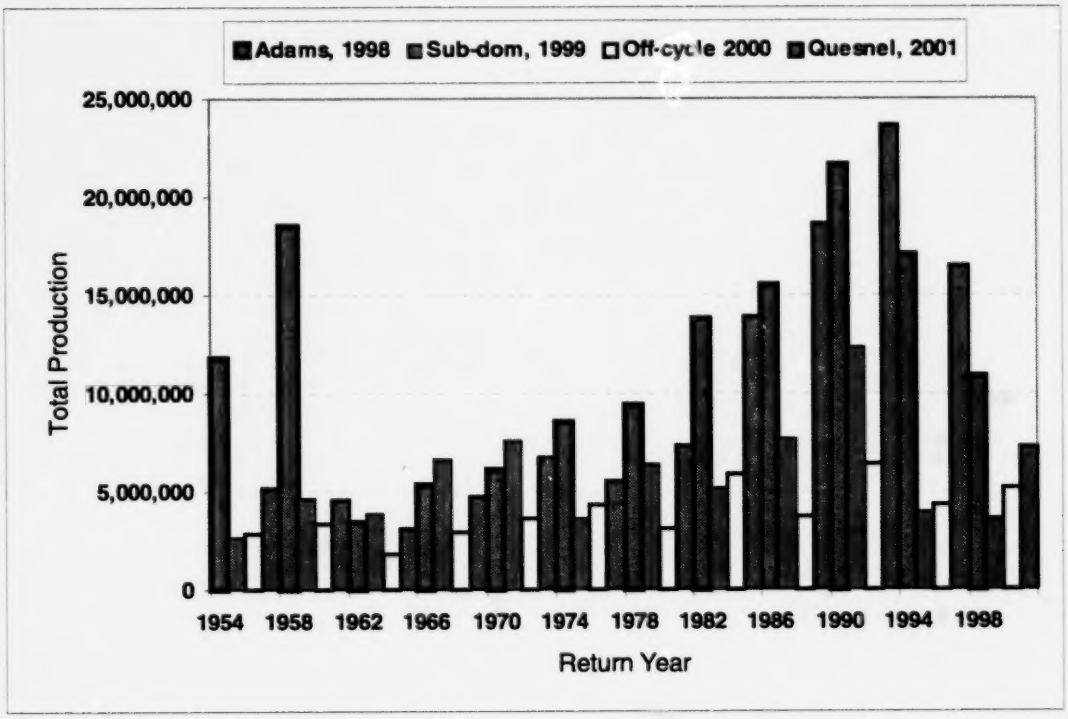
The population structure of Fraser River sockeye is complex by any means of assessment. The spawning runs begin in June and continue through October. A Fisheries and Oceans Canada review of sockeye spawning escapements for 1994 identifies 151 Fraser sockeye runs that are significant enough that they are consistently enumerated. For management purposes, these runs are grouped into only four overlapping run-timing groups: Early Stuart (migrates through the lower Fraser River from late June to late July), Early Summer (mid-July to mid-August), Summer (mid-July to early September), and Late (early September to mid-October). The Early Stuart group consists of about 32 runs that return to distinct spawning areas in the Takla/Stuart drainage in the Upper Fraser. The Early Summer aggregate consists of about 34 stocks returning to the Lower Fraser, Seton-Anderson, South Thompson, North Thompson, Chilcotin, Nechako and Upper Fraser. The Summer run aggregate consists of about 33 runs returning to spawning areas in the Quesnel/Horsefly, Chilcotin, Stuart and Nechako drainages. The Late run aggregate is comprised of 52 populations that spawn in the lower Fraser, Harrison-Lillooet, Seton-Anderson and South Thompson systems. It includes the Cultus, Birkenhead, Harrison, Weaver, Portage and Shuswap populations, as well as the world famous Adams River sockeye run.

4.1.1 Trends in the Total Fraser Sockeye Returns

Most of the major populations follow persistent four-year cycles of abundance. While not all populations cycle synchronously, the fluctuations in abundance of some populations (Lower Adams River Lates and Quesnel River Summers) dominate the overall trend in a pattern termed 'cyclic dominance'. Total returns during the dominant-year cycle line (i.e., 2002, 1998, 1994, etc) have increased consistently since the 1960s from about 3 million in 1962, up to about 22 million in 1990. The subdominant-year cycle line (2001, 1997, 1993, etc.), which

precedes each dominant year, has also increased over the same time period. It exceeded the dominant-year cycle in 1993 and 1997. The largest Fraser River sockeye return on record since the 1950s occurred in 1993 at about 24 million. Abundances in the two 'off-cycle' lines (i.e., 2000, 1996, 1992, etc. and 1999, 1995, 1991, etc.) have fluctuated but without any particular trend. The 2000 off-cycle line has remained consistently in the 2 to 4 million range. Since the high return in 1993, abundances in the dominant, subdominant, and the 1999 off-cycle line have shown substantial and alarming declines, largely due to reductions in marine and freshwater survival rates.

Figure 3. Trends in total returns of Fraser River sockeye, 1954-2001



Source: Pacific Fisheries Research Conservation Council 2001-2002 Annual Report, p. 11, Figure 2.3. The dark bars represent years of dominant-year cycle returns. The three light bars following each dark bar are in sequence: the first off-cycle line (includes years 1955 and 1999), the second off-cycle line (includes years 1956 and 2000), and the subdominant-year cycle line (includes years 1957 and 2001).

Beginning in 1987, Fisheries and Oceans Canada initiated a management and enhancement plan to increase sockeye salmon production in the Fraser River. This plan included the implementation of stock- and cycle-line specific interim spawning escapement goals and reductions in the historical average exploitation rates of 75-85% to 65-70%, with even lower rates in recent years. These measures were expected to result in progressive increases and achievement of the interim escapement goals within six cycles (Cass *et al.* 2000). While the rebuilding initiative initially appeared to provide desired results, it coincided with

a temporal period of generally favourable marine survival. By the mid-1990s, the favourable marine survival conditions had reversed and together with additional, unanticipated mortality factors affecting Late run sockeye, Fraser River sockeye abundance has declined in each cycle line.

4.1.2 Early Return Timing of Late Run Sockeye

Late run sockeye migrate from the open ocean into the Strait of Georgia in August where they typically remain for up to six weeks before resuming their migration into the Fraser River in September and early October. Since 1995, the migration into the river has been progressively earlier. In 2000, the delay was only one day, resulting in a median river entry in mid-August compared to the normal late September. Recent studies co-ordinated by Fisheries and Oceans Canada in the summer of 2002 have confirmed the continuation of the early-return timing.

While the cause of the early migration into the river is currently unknown, the consequences have been dramatic. Early migration has been associated with high levels of mortality along the migratory route and in terminal areas, as well as elevated levels of pre-spawning mortality in the natal streams and lakes. The cause of these mortalities (>90% since 2000 in two of the major populations, Lower Adams River and Weaver Creek) is unknown, but they have been associated with heavy infestations of *Parvicapsula minibicornis,* a naturally occurring parasite that attacks the kidneys and gills (St-Hilaire *et al.* 2001). Pre-spawning mortality and low marine productivity are probably the major factors contributing to the declining trend in return abundance of the dominant cycle.

Intensive studies during the return period of 2002 revealed an unexplained decrease in pre-spawning mortalities. It is unknown whether the previously high levels of pre-spawning mortality on Late run sockeye will resume in 2003.

4.1.3 Cultus Lake Sockeye

Cultus Lake sockeye are one of the populations contributing to the Late run aggregate. A recent stock status report reviewed by PSARC detailed an unequivocal and serious decline on all four cycle lines in the past twenty or more years. Whereas this population formerly exceeded 100,000 in some years for the total return (when a predator control program was in place), most returns since the mid-1980s have been under 10,000. In 1997, only 88 adults were estimated to have arrived on the spawning grounds. The situation for this population is considered so dire that they were accorded 'endangered' status through an emergency listing by COSEWIC on October 24, 2002. However, abundance was higher in 2002, with an estimated escapement for Cultus sockeye of 4,882 fish.

Numerous factors have been identified that have affected Cultus Lake sockeye, including historic over-harvesting (although there have been no targeted fisheries on these stocks in recent years), poor marine survival, habitat concerns, and

predation. They have also been impacted severely in recent years by high pre-spawning mortality.

4.2 Habitat

Successful salmon stewardship requires effective habitat protection as part of a comprehensive approach to maintain freshwater productivity and to ensure conservation and good resource management. While the mainstem Fraser River has not been dammed for hydroelectric generation as other major rivers have, there are other ongoing habitat pressures that require extensive monitoring and control. These include urban development, industrial practices, agricultural impacts, transportation routes, and the introduction of exotic species. While these factors were not the primary concern related to the conduct of Fraser River sockeye fisheries, they are critical to conservation and fisheries resource management. It is broadly acknowledged that habitat protection must be integrated into an overall approach for Fraser River sockeye.

4.3 Public Perceptions and Attitudes

Pacific salmon are an icon of British Columbia's natural bounty and a symbol of environmental well being. While the fishery has contributed significant benefits to the economy of British Columbia, and particularly to some coastal communities, the value of resource goes far beyond its contribution to the economy. Salmon is an important part of British Columbia's culture and there is growing apprehension about their well being, combined with an awareness that salmon are fragile. Although there is some awareness of the significant fishery restrictions over the past five years, the public perception is that declines in salmon abundance are ubiquitous. The reality is that there is much variability and that while some stocks are not doing well, some others are healthy.

4.4 Harvest Sectors

4.4.1 First Nations

First Nations have a long history of salmon fishing in British Columbia, which is inextricably tied to their culture, history and society. First Nations have a strong concern over depleted stocks and the need for conservation and rebuilding, especially when it concerns salmon from their respective territories.

First Nation people participate both in fisheries for food, social and ceremonial purposes, and commercial fisheries for economic well being. The economic fisheries include pilot sales in the lower Fraser River, conducted on a communal basis, and participation in the commercial fishery. In recent years, coastal First Nations have suffered hardship as a result of reduced harvest opportunities in commercial fisheries. Within the Fraser River, some First Nations have had successful fisheries but some others have not met their food, social, and

ceremonial requirements, particularly for up-river First Nations. As well, there are numerous First Nations with an interest in increased commercial fishing opportunities for Fraser sockeye, both in marine areas and in terminal areas within the Fraser River.

4.4.2 Commercial

The commercial salmon fishery traditionally comprised two-thirds of the wholesale value of B.C. fishery products, and Fraser River sockeye have been the mainstay of the commercial salmon fishery. Recently, that has declined to less than 40%. Since the mid 1990s, the commercial salmon fishing fleet has suffered declining prices, due mainly to increased supply from international aquaculture production, and reduced fishing opportunities. As a result, the landed value of salmon in British Columbia has declined from a peak of $312 million in 1988, to a low of $25 million in 1998, when commercial fisheries for Fraser River sockeye were closed. There has been a corresponding decline in salmon catch from a high of just over 100,000 metric tonnes in 1985 and 1986, to 20,000 metric tonnes in recent years (1999-2001). The commercial salmon fishing industry is facing a very difficult financial situation. However, the industry continues to support conservation and measures to rebuild salmon stocks.

During the mid to late 1990s, licence reform and fleet restructuring were undertaken in an effort to improve fleet viability. Since 1996, there have been two major licence retirement programs that reduced the eligible fleet by 54%, at a cost of $272 million. There are now 2,166 commercial salmon licences. As well, gear and area licensing was introduced in 1996, establishing two seine areas, three gillnet areas, and three troll areas along the B.C. coast, and providing for licence stacking, which further reduced the number of active vessels. Despite these programs, the commercial salmon sector still faces economic hardship.

The maintenance and development of markets for Canadian caught salmon is particularly important to the salmon industry. Major European importers of salmon products have threatened to stop buying Canadian salmon unless Canada obtains certification by the Marine Stewardship Council (MSC). Continued access to these markets will depend on Canada being able to demonstrate that its harvest management program provides for sustainable management of salmon. Fisheries and Oceans Canada is working with industry on MSC certification of B.C. salmon fisheries, but the process has become far more complex than anticipated and the evaluation is taking longer than initially expected. This contributes to the economic uncertainty faced by industry.

4.4.3 Recreational

The recreational fishery in British Columbia provides angling enjoyment for over 200,000 licence holders, and is a major contributor to tourism in coastal communities. Its participants share with other harvest sectors a conviction that

conservation must come first, and that all participants in the fishery should contribute to the rebuilding of salmon stocks. The tidal water recreational fishery is focused mainly on salmon and there is also an expanding recreational fishery in the Fraser River. Like other fisheries, harvest opportunities for the recreational sector have been restricted in recent years, with significant measures introduced in 1998 in support of coho recovery. With these restrictions, participation in the recreational fishery has declined, which has affected the associated businesses, including tourism.

4.5 New Management Challenges

A number of new management challenges face the Department and stakeholders.

- **Marine Survival** – During the mid 1990s, ocean survival of many salmon stocks originating in British Columbia declined to record low levels. Because we have little, if any, ability to control or alter ocean survival, harvests had to be restricted in order to ensure that conservation and escapement goals were met. The uncertainty associated with ocean survival rates and our capacity to forecast them adequately continues to influence how we must manage fisheries. Climate change could significantly increase the uncertainty in forecasting.

- **Pre-Spawning and In-River Mortality** – Since 1996, pre-spawning and in-river mortality of Late run sockeye has been consistently high, with some evidence it may have exceeded 90% in 2000 and 2001. The Department does not have a full understanding of the factors influencing in-river mortality, however it is being studied; future mortality rates remain uncertain; and there is no reliable in-season indicator. Determining exploitation rates that provide the appropriate level of caution (or risk) remains very difficult.

4.6 DFO Program Capacity

The completion of the Canadian Fisheries Adjustment and Restructuring program and reduced funding to the Salmonid Enhancement Program has led to funding pressures within Pacific Region of Fisheries and Oceans Canada. As well, there is an array of demands for new and expanded activities to be undertaken by the Department. This has required an in-depth analysis of the allocation of resources between key programs and the development of new approaches to resolve financial issues for both the short and long term. Program adjustments are needed to ensure that programs are consistent with the budget, and consequently activities are being prioritized and resources reallocated where necessary.

4.7 First Nation Treaties and Land Claims

Treaties and land claims with First Nations are under negotiation, and substantive progress has been made toward an agreement in principle with the Snuneymuxw (Nanaimo) and Lheidli T'enneh Nations in relation to salmon and other species. The

Department is approaching these negotiations with the objective of ensuring an effective and efficient management approach. As these negotiations move forward, and others come into play, overall salmon allocations will be affected and new management regimes will be required.

4.8 International

Management of Fraser River sockeye is unique because of the need to cooperate with the United States, and the role played by the Fraser River Panel of the Pacific Salmon Commission. Fraser River sockeye migrate through U.S. waters where they are subject to interception fisheries. Both countries have a long history of dependence on these stocks, and there have been a series of agreements and treaties concerning these stocks dating back more than a century. The 1985 Pacific Salmon Treaty established a forum for negotiation of co-operative approaches on rational management and conservation for all Pacific salmon stocks subject to interception fisheries, including Fraser River sockeye. While the agreements that have been reached under the Treaty on the management of Fraser River sockeye establish limits on U.S. fisheries, they correspondingly constrain, to some extent, the management of Canadian fisheries.

5. First Nation and Stakeholder Perspectives

As a key part of this review, a series of meetings were held in December and January with First Nations and stakeholders (conservation organizations on December 4, 2002; commercial sector on December 10, 2002; recreational sector on December 11, 2002; and First Nations on January 9, 2003). Some groups held pre-meetings to gather the widest range of input possible from interested parties. As well, written submissions were received from a number of organizations. The following is a summary of the comments and recommendations received.

5.1 First Nations

First Nations participate in a number of different salmon fisheries for Fraser River sockeye. All First Nations have a constitutional right to fish for food, social and ceremonial purposes. There are various agreements with some First Nations that provide for commercial access. As well, First Nation individuals and First Nation communities hold more than 25% of the commercial salmon licences.

There is unanimous support amongst First Nations for conservation measures that will protect all stocks and provide adequately for First Nations in their various fisheries. However, there is a difference in the emphasis and the approaches to conservation between coastal and freshwater areas. It is also noted that non-fishing factors, such as habitat protection, must be addressed in the context of a comprehensive conservation approach for Fraser River sockeye.

There is widespread concern that food, social and ceremonial requirements have not been met for some First Nations, particularly in the upper river areas. Global formulas for setting allowable catches do not assure that community needs are met. First Nations are calling for measures to ensure that food, social and ceremonial needs can be met in the future. As well, they note a strong preference for fishing in their traditional territories using their own preferred fishing techniques.

Regarding commercial fisheries, coastal First Nations dependent upon existing commercial access have suffered economic hardship due to limited commercial fishing opportunities in recent years. A more flexible approach with respect to the 15% exploitation rate limit on Late run sockeye that would change in response to abundance was proposed to provide for increased access. However, Fraser River First Nations were opposed to the 15% limit on Late run sockeye, in favour of a 10% limit. As well, the Soowahlie First Nation has repeatedly protested the impact of commercial fisheries on Late run sockeye.

Some First Nations are also calling for a new policy framework that would provide for economic fisheries in terminal in-river areas, based on shifting benefits from current commercial fisheries. Co-operative approaches or joint ventures with existing marine harvesters could be used to facilitate the development of terminal fisheries for

economic purposes. However, there are significant obstacles to implementing any proposal that entails the transfer of fishing effort, or fish, across areas.

A number of issues were raised by First Nations related to the management of Fraser River sockeye fisheries in 2002.

- There was strong concern regarding the lack of consultation with First Nations on two issues: the in-season adjustment of the 15% exploitation rate limit on Late run sockeye, and the Johnstone Strait commercial fisheries that were conducted in late August when Late run sockeye were predominant.
- First Nations also identified the need for better in-season information on abundance, stock assessment, migration behaviour, etc. To assist in addressing this, it was proposed that First Nations participate more in test fisheries, and in the development and implementation of improved stock assessment programs. They also requested the inclusion of traditional knowledge into conservation and management regimes.
- First Nations called for more equitable enforcement, noting that the Department has not seized catches and gear used by commercial harvesters in protest fisheries, whereas the catches and gear of First Nation harvesters have been seized.

5.2 Conservation Organizations

The focus of conservation organizations on the protection of weak stocks, and they note that dozens of Fraser River sockeye stocks remain at low levels of abundance. They are seeking to have fisheries and escapement plans developed on a stock specific basis.

Conservation organizations have called for the full and effective implementation of risk averse and precautionary approaches to ensure conservation of the diverse array of stocks within the Fraser River. This is seen as particularly important because of the uncertainty concerning abundance estimates, migration timing, and other dynamics of stock behaviour. Escapement goals, harvest rates, and management flexibility were identified as the primary issues that need to be addressed to facilitate future improvements in the conservation and management of Fraser sockeye fisheries. Moreover, they are of the view that the Department has been unfairly accused of imposing unnecessarily inflexible and overly cautious measures during the 2002 Fraser sockeye fishery.

For endangered stocks, an exploitation rate ceiling of three to ten per cent is proposed. With regard to the Fraser River, this would apply to Cultus Lake sockeye and Interior B.C. coho. During the meeting with conservation organizations, particular concern was expressed about the in-season decision to adjust the 15% exploitation rate on Late run sockeye, the scientific basis for that decision, and the risk posed to weaker stocks.

The following key points are advocated by conservation organizations:

- Greater management flexibility must not compromise objectives aimed at conserving the diversity of Fraser River sockeye runs.
- Consultation processes on fisheries management must be expanded to provide for broader participation from groups not previously included.
- The exploitation rate ceiling for endangered stocks should be between three and ten per cent.
- More effective implementation of the precautionary approach and risk averse management is required.
- The Department must clarify its role and function, and must uphold international commitments.

As well, conservation organizations have three proposals for the 2003 season:

- A research program on the effects of high spawner densities of sockeye in the Adams River in 2002, including the impact on the water chemistry and productivity, and the contribution of high spawner densities on the ecosystem;
- A thorough stock assessment of all Fraser River sockeye runs; and
- The adoption of more selective harvesting methods, with catch limits for target species and strict by-catch limits.

5.3 Commercial Sector

The commercial fishing industry supports conservation, and has contributed significantly to conservation and rebuilding. As a result, the commercial fishing industry has suffered economic hardship since strict measures were implemented in the mid 1990s. During the meeting with the commercial sector, their key demand was for some flexibility in fisheries management to provide for additional fishing opportunities when there is sufficient abundance.

Recommendations were provided on decision-making, management flexibility, adequacy of consultation, in-season data, conservation objectives, enforcement and Departmental funding. They called for a re-balancing of conservation and economic goals for the fishery. They would also like to see greater stability in terms of the harvest opportunities provided, as opposed to the highest catch possible each year. They have concerns about decision-making and accountability within the Department, and feel that this has made consultation more difficult. They would like the IFMP and its decision rules to be more flexible, to provide for more harvest opportunities when there is sufficient abundance. A review of financial expenditures and priorities is called for to ensure that the focus is on the core responsibilities of conservation and fisheries management. Finally, they request improved enforcement and fisheries monitoring.

The following are the key recommendations from the commercial fishing sector:

- The Department should clarify the lines of responsibility and accountability for its managers to provide for timely and well-informed decisions regarding harvesting strategies.
- The IFMP needs to be more flexible, so that it allows for changes in management strategies and harvest rates when the underlying parameters (abundance, stock composition, migration timing, etc.) are not as forecast.
- New approaches to the provision of biological data should be considered to improve in-season management information, and the "triggers" for the start of pilot sales fisheries should be adjusted accordingly.
- In setting exploitation rates or harvest rate limits, a risk assessment should be conducted including a benefit-cost analysis for the resource and the industry.
- A comparison of DNA and scale analysis is required to provide a better understanding of the implications for the resource and the fishery.
- Enforcement policy needs a level playing field.
- All First Nations and stakeholder groups must play an expanded role in enforcement and share in the accountability for non-compliance. It is recommended that non-compliance in any fishery should lead to its closure.
- The Department needs to evaluate its funding priorities to focus on the protection of fish and the management of fisheries. Also, funding designated for implementation of the Pacific Salmon Treaty should not be reallocated.
- The role of the Science Sector within Fisheries and Oceans Canada, and how it provides advice for the development of the IFMP and for decision making, needs to be evaluated.
- A multi-sector forum is proposed for consideration of broad objectives related to the development of management plans.
- A formal process to identify sector representation is required.
- It is proposed that the Fraser River pilot sales fishery should be prosecuted on the same stocks as commercial fisheries, which implies that they not necessarily occur during the same calendar period. Within the Fraser River, consideration should be given to conduct of overlapping fisheries during a given period.

5.4 Recreational Sector

The recreational sector would like conservation goals to be clear and explicit. It notes that non-fishing factors, such as habitat protection, should be incorporated into conservation objectives for weaker stocks. With regard to the conduct of fisheries, it would like decision rules, such as the 15% exploitation rate for Late run sockeye, to be more flexible so that appropriate adjustments could be made in response to changed circumstances. Moreover, risk management, not risk elimination, should be considered in fisheries management decisions.

Decision making within Fisheries and Oceans Canada is criticized as being slow, inflexible and administratively complex. Moreover, it is the view of the recreational sector that there were significant breakdowns in the consultation process in 2002.

There is a strong perception that in-season enforcement is inadequate and uneven, and that it has been adversely affected by Departmental budget constraints.

During the meeting with the recreational sector, advisors emphasized the critical importance of stability and predictability for the recreational fishery. Short notification periods regarding changes to the fishery are problematic. As well, advisors made a strong argument for better means to distribute information related to the recreational fishery.

The following are the key recommendations from the recreational sector:

- In accordance with *An Allocation Policy for Pacific Salmon,* stable and predictable opportunities should be provided, consistent with conservation, First Nation obligations, and with the designated catch allocation for sockeye.
- Closures should not be implemented with less than 48 hours notice.
- The consultation processes with the recreational sector should be revitalized based on the recommendations of the Institute for Dispute Resolution.
- Decision-making within the Department should be streamlined and made timelier.
- Decision rules for in-season management of the fishery should be more flexible, to allow for some adjustment of fishing opportunities in response to available abundance.
- Scientific advice should focus on providing information to assist in fisheries management. It is further noted that adequate funding to understand the migration behaviour and high in-river mortality of Late run sockeye is required.
- The review of Fraser River sockeye escapement goals should be completed in advance of the 2003 fishing season.
- The process by which an expected Fraser River sockeye catch for the recreational sector is determined must be clarified.
- Management decisions by Fisheries and Oceans Canada must take into account the significant difference in harvest levels between the recreational and commercial fisheries, as well as the differences between the marine and in-river components of the recreational fishery for Fraser River sockeye.
- Departmental managers must make a greater effort to understand the needs of the recreational fishing sector and to trust advice of the established advisory process.
- The Department should avoid usurping the management role of the Fraser River Panel.

5.5 Pacific Fisheries Resource Conservation Council

In a written response, the Pacific Fisheries Resource Conservation Council urged the use of a cautious approach to conservation and management, given the lack of knowledge about the root causes of the pre-spawning mortality of Late run sockeye stocks. The Council suggested the Fraser River review should address three significant issues:

- the establishment of escapement goals or ranges by "stock" that recognize the uncertainty in annual returns (stock goals);
- the establishment of the policy framework required to assess risk to specific stocks within Fraser River sockeye conservation units (stock aggregates as described in the draft Wild Salmon Policy; i.e., the management framework); and
- the assessment of the in-season capability to monitor abundance and expected mortality rates; and the adequacy of Departmental resources for monitoring (management control by stock and data sufficiency).

6. Key Issues

Throughout this process, the groups expressed clearly divergent views on some issues, but there were a number of common themes. These shared views are particularly important as they mark areas where there is greater opportunity to move forward on basis of consensus.

6.1 Conservation

There is a universal commitment to the principle of conservation among all the groups consulted. However, despite the shared conviction, there is a substantial diversity of views over how to define conservation, what degree of risk may be acceptable, and how to provide for an economically viable fishery that is compatible with the achievement of conservation goals. In order to ensure a more orderly management regime, there is a need to have an inclusive process to define conservation goals, and ensure they are well understood by all participants.

6.2 Wild Salmon Policy

The *Wild Salmon Policy - Discussion Paper* (March 2000) sets out a framework for the conservation and rebuilding of wild salmon stocks. There have been extensive consultations on the discussion paper, but the policy has not been finalized. Historically, stocks have been managed and conserved on the basis of stock aggregates, however that approach has not addressed the requirements of weaker populations. The draft policy moves toward a structured and transparent approach to conserving wild salmon and their ecosystems. Implementation guidelines on resource management, habitat management, aquaculture, and enhancement are currently under development. First Nations and stakeholders have unanimously called for the finalization of a wild salmon policy, in order to clarify how conservation should be implemented and, by implication, how fisheries should be managed.

6.3 Species At Risk Act (SARA)

SARA received royal assent on December 12, 2002, and the legislation is expected to come into force in June 2003, once an appropriate regulatory regime for implementation has been put in place. The Act provides a more rigorous and consistent approach to the conservation and recovery of plants and animals at risk within Canada. Formal recovery and action plans need to be completed within one year of a Governor in Council decision to legally list species. Once stocks have been listed, SARA requires the establishment of multi-stakeholder teams to provide advice on the development of recovery and action plans.

Regarding the Fraser River, Cultus Lake sockeye and Interior B.C. (Thompson River) coho have been designated as endangered by COSEWIC, however Governor in Council approval of the listings has not yet been considered and formal recovery plans have not been completed. For B.C. Interior coho, strict conservation measures

have been in place since 1998, and increased returns have been observed. Cultus Lake sockeye were listed in the fall of 2002 under an emergency listing process, and new measures will be considered in the context of the management plan for 2003.

6.4 Consultation Processes

The New Direction paper, *A Framework for Improved Decision-Making in the Pacific Salmon Fishery,* (June 2000) has not been finalized and many of the key issues have not been addressed. While this review on Fraser River sockeye fisheries in 2002, did not address the specific recommendations related to the report or the follow-up consultation process by the Institute for Dispute Resolution, the events of the 2002 Fraser River sockeye fishery emphasize the problems of the existing process and reinforce the need for improvement. There are continuing problems with communication and consultation. Lack of accountable representatives and appropriate venues for consultation make it difficult for First Nation and stakeholder concerns to be brought forward and articulated in a clear and consistent way, and for all interested parties to be informed about final decisions and their rationale. There is often conflicting advice and no opportunity for dialogue between the parties. This has resulted in confusion regarding the Department's management approaches and frustration with its decisions. It was the consensus view of First Nations and stakeholders that improvements in decision-making and consultation processes are required.

6.5 In-Season Decision-Making

The management of Fraser River sockeye fisheries in 2002, brought to the foreground concerns about decision-making authority within the Department, particularly as it relates to in-season management. Across the board, representatives called for a transparent and comprehensive approach to address issues that are not provided for within the context of an IFMP. Virtually all sectors were critical of the approach taken by Fisheries and Oceans Canada regarding in-season adjustments to the exploitation rate for Late run sockeye and there were divergent views regarding the appropriateness of those changes. The IFMP needs to provide the necessary and essential direction on conservation and fisheries management, over a wider range of potential outcomes in order to provide sufficient flexibility to managers so they can respond to or take into account in-season factors that are uncertain or variable. Because changes to ministerial decisions and international agreements are inherently difficult, the IFMP and agreements with the U.S. should be designed to avoid the need to make such changes. Where in-season decisions are required, they should, ideally, be within the context of an approved IFMP, the decision-making process should be clear and expeditious, and it should provide for appropriate consultation with the relevant interests.

6.6 Decision Rules

Decision rules for fisheries management were introduced in a few salmon fisheries in 2001, and expanded to cover most fisheries in 2002. The intent was to explain how fisheries would be adjusted in-season to a range of reasonably expected circumstances. Advisors expressed concern that the 2002 decision rules for Fraser River sockeye implied that there was flexibility to adjust the Late run sockeye exploitation rate but did not specify how or under what circumstances adjustments would be made. Although returns were much greater than forecast, and there was evidence that at least a portion of the Late run was delaying, the final decision was to revise the implementation of the 15% exploitation rate, but not to change it in a substantive way. This gave rise to questions concerning the flexibility of decision rules, or lack thereof, and their appropriate application to specific circumstances.

6.7 Risk Management

The commercial sector has called for a clarification of how scientific advice is provided and is advocating the development of a risk assessment framework to evaluate the implications of different management options. All groups have expressed concerns regarding the uncertainty of Fraser River sockeye migration timing and in-river mortality of Late run sockeye.

Work began in 2002, to develop this framework, which is ultimately required to assess implications of different management options so that stakeholders and decision-makers are informed about the relative merits of each management option. As part of this process, stakeholder input is being sought through formal workshops to advise on spawning escapement objectives.

Rather than viewing this initiative as a new approach to management, it should be viewed as an incremental process that builds on new information (from population and ecosystem dynamics), new policies (wild salmon policy) and new legislation (the *Species At Risk Act*). The risk assessment framework combines assumptions about the underlying uncertainty in population dynamics, including environmentally driven variations in survival, with proposed conservation and management objectives to estimate harvest control rules and performance indicators. A simulation model is being developed to estimate the optimal exploitation rate over a range of run sizes that maximizes particular objectives including conservation and socio-economic objectives. The output from the model is the optimal exploitation rate curve and the probability of not meeting specified performance objectives.

6.8 Data

Across the board, the parties consulted were critical of the data available to manage Fraser River sockeye fisheries in 2002. Various comments were expressed about the timeliness, adequacy, and accuracy of in-season estimates of abundance, migration timing and route (diversion rate around Vancouver Island), stock composition, and

catch. There were concerns that reduced stock assessment work in-river would significantly compromise data essential to the future good management of the resource, and to fulfil obligations under the Pacific Salmon Treaty. As well, both First Nations and commercial fishing interests were of the view that their traditional or on-the-ground knowledge was not taken into account properly. In some cases, budget constraints limited the activities that could be undertaken by Fisheries and Oceans Canada in 2002, however none of these reductions affected in-season management. Some valuable suggestions were provided on new or alternative approaches that could facilitate improved data collection.

6.9 Enforcement

At each of the meetings with stakeholders, concerns were expressed about insufficient enforcement, the need for more resources, and the lack of a "level playing field." However, there are divergent views on which fisheries may have been subject to less stringent enforcement. Protest fisheries have become a common occurrence in support of, or in opposition to, various claims for rights or entitlements. There are very strongly held views regarding who should fish, and the allocation priorities associated with those fisheries. There is no debate from stakeholders that the Department's Conservation and Protection Program plays an essential role in the management of Fraser River fisheries.

It is a significant challenge to meet increasing demands for a broad array of enforcement activities. Like other enforcement agencies, the Department is moving toward strategic targeted enforcement rather than "general patrols" to ensure the most effective use of program capacity. This entails identifying priority activities and areas for enforcement. As well, agreements have been reached on enforcement and safety protocols with some First Nations, and co-management arrangements with several commercial harvesting groups (e.g. the Underwater Harvesters Association). These could provide a model for other salmon fisheries.

6.10 Selective Fishing

A Policy for Selective Fishing in Canada's Pacific Fisheries (January 2001) sets out principles and an implementation framework to ensure that selective fishing technology and practices are adopted where appropriate, and that there are continuing improvements in harvesting gear and practices. Existing approaches under the selective fishing policy have focused on species-based selectivity. While stock specific selectivity in fishing would provide for more precision in fisheries management, there are practical limits on the feasibility of stock specific selectivity. Progress in the development and implementation of selective fishing gear and practices has been made, and yet further developments in selective fishing are required. Implementation of the selective fishing policy will continue, with further development of selective fishing technology and practices. However, selective harvesting practices alone will not resolve mixed stock issues among the Fraser River stock groups.

7. Recommendations

In British Columbia, salmon serve as food and wealth for First Nations and are a source of their cultural identity; they provide jobs and income for Canadians, businesses, and coastal communities; they provide recreation and enhance the quality of life; and serve as a measure of our environmental health and well being.

Management of the Pacific salmon resource and its fisheries is complex. This complexity is a function of a number of factors; the biology and behaviour of salmon; their fragility and sensitivity to habitat destruction; increased uncertainty due to changing climatic regimes, the large and diverse interests that compete for access; and the differing societal objectives for the resource.

The range of objectives held by the various interests is illustrated by the diversity of views expressed at the public meetings, which have contributed to this review of sockeye management. First Nations in inland areas advocate fishery restrictions in order to rebuild depleted populations, meet food, social and ceremonial requirements, and provide for terminal economic fisheries, while First Nations in coastal communities seek viable fishing opportunities that are consistent with conservation. Recreational interests have requested greater stability and predictability. Commercial fishermen are seeking to sustain their investment in the fishery and desire a more flexible management regime that will allow harvesting when stocks are abundant. Conservation organizations support a more precautionary approach to the protection and rebuilding of spawning populations. As well, they want to minimize risk, and meet broader ecosystem objectives.

All of these objectives are valid, but they cannot all be met simultaneously. Achievement of one will often preclude achievement of another. This reality underpins much of the controversy and rancour over salmon management. At the heart of most of this debate is a continuing struggle over differing objectives, and a lack of clarity over what results are to be realized through the Department's program of salmon management. Achieving greater clarity with respect to objectives and management outcomes will provide a more sustainable foundation for management of the salmon resource. This can only be done through inclusive and transparent consultation processes that allow an informed weighing of various courses of action, and choices to be made on management objectives. In the absence of greater clarity around the policy objectives that are to be met, Departmental performance will be judged on the basis of objectives set unilaterally by others. In this circumstance, the Department's performance will inevitably be found wanting, and management will continue to be rancorous and marred by conflict.

A key outcome from this review of sockeye management must be to contribute to building consensus around management policy, and management objectives. This work must include five linked policy challenges and must be supported by strong management planning within Fisheries and Oceans Canada:

- First; finalizing a wild salmon policy
  What are we trying to conserve, and how?

- Second; consultation
  How should advice be provided?

- Third; development of the IFMP and pre-season planning
  What results are we trying to achieve?

- Fourth; in-season management
  What improvements are needed to support in-season management?

- Fifth; roles and responsibilities
  What are the respective roles of Fisheries and Oceans Canada and the Fraser River Panel, and how should they be structured to facilitate in-season management of the fishery?

7.1 Wild Salmon Policy

There is a need for development of a policy on wild salmon that explicitly defines conservation objectives for naturally spawning salmon. The recreational sector requested clarification of conservation objectives and rebuilding goals for Fraser River sockeye. Similarly, conservation organizations said that Fisheries and Oceans Canada must articulate conservation objectives and meet public expectations and Canada's international obligations to conserve biological diversity. The commercial sector pointed to the need for uniform understanding of the origin, intent, and consequences of conservation and management rules. First Nations stated that clearly defined conservation objectives for Fraser River sockeye are essential, and development of these objectives through the completion and implementation of the Wild Salmon Policy should be an immediate priority. They also advocated individual sockeye populations as the basis for conservation measures. The Pacific Fisheries Resource Conservation Council recommended the establishment of escapement goals by "stock." In their various ways, each group has called for a clear and coherent approach to conservation of wild salmon.

Recommendation 1: Wild Salmon Policy

It is recommended that the Department conduct consultations on a wild salmon policy and associated guidelines, with First Nations, harvesters and other interest groups including conservation organizations, and the policy should be finalized by December 31, 2003. This policy will provide a framework for defining conservation objectives for naturally spawning salmon and will include direction for resource management (conservation units and reference points), habitat protection, enhancement and aquaculture.

7.2 Consultation

It has been recognized that the present advisory process with respect to the management of Pacific salmon fisheries needs improvement. First Nations referred to the lack of consultation regarding key in-season decisions as a particular problem. The recreational sector identified a breakdown in consultation processes and noted the need for timely decisions with adequate communication. The commercial sector, too, found that consultation processes were inadequate and requested a more comprehensive process for harvest planning that would include commercial, recreational, pilot sales and food, social and ceremonial fisheries. Commercial interests requested a forum of user groups to discuss the broad objectives or criteria associated with resource management planning. Conservation organizations have said that fishery decisions must be made in public. There was a consistent message expressing concern about consultations for both the pre-season development of the IFMP and the in-season management of the fishery. It is recognized that there is a federal obligation to consult with First Nations, and the proposed processes would enhance existing consultation mechanisms.

Recommendation 2: Advisory Processes

It is recommended that new advisory processes be developed by the fall of 2003 for the provision of advice on policy issues and harvest planning to facilitate improved, transparent consultation:

- **Policy Advisory Process - A new formal, structured policy advisory process is proposed. Specifically, a policy steering committee should be established that represents the full range of interests for the conservation and management of Pacific fisheries resources including First Nations, commercial and recreational fishing sectors, conservation organizations[3], community groups, and the provincial government. This committee would provide a venue for broadly based dialogue with the Department on major policy matters affecting the fishery, including a wild salmon policy, risk management, and socio-economic objectives. It would also provide advice on the full range of interests that need to be consulted further and the best means of obtaining input on specific policy matters of concern.**

- **Assignment to Policy Advisory Process – Given that the conservation concerns associated with some mixed stock fisheries are likely to result in harvesting opportunities to more terminal areas, it is recommended that the policy steering committee, once established, should be asked to provide advice to clarify the policy on access and allocation. Consultation with affected parties should occur in the fall of 2003 to discuss issues, and**

[3] There is a difference of opinion over whether this should refer to separate inclusion of environmental groups and stewardship/streamkeeper groups.

provide information to support a policy decision before the 2004 salmon fishery.

- **Harvest Planning - A more streamlined and representative cross-sectoral advisory process is proposed for harvest planning and post-season review. Specifically, two new salmon harvest planning committees, one each for the north and the south. A three-phased process would be established to provide co-ordinated advice to the Department on the development of IFMPs:**

  1. Advice on conservation objectives and science-based risk management would be provided by representatives from First Nations, the recreational and commercial sectors, and conservation organizations[4].

  2. Harvesters (representatives from First Nations and the recreational and commercial fishing sectors) would develop proposals on the conduct of fisheries consistent with phase 1, for inclusion in draft IFMPs.

  3. First Nations, the recreational and commercial sectors, and conservation organizations[4] would provide advice on draft IFMPs focusing on ensuring consistency between conservation objectives and proposed fisheries, and on any cross-sector integration issues requiring resolution. As well, they would participate in post season review.

- **Fraser Panel - The Fraser River Panel of the Pacific Salmon Commission will continue to serve as a focal point in the in-season management of Fraser River sockeye and pink.**

Fraser River First Nations

Advice from First Nations is critical to the overall consultation process for Fraser River sockeye. The Fraser River Aboriginal Fisheries Secretariat (FRAFS) was established in 1993 to oversee a watershed Aboriginal Fisheries Forum process, however during the late 1990s participation waned and the agreement which established the process lapsed. In 2001, an independent review made 13 recommendations to revitalize the process, which led to the establishment of an Interim Executive Committee with First Nations and Fisheries and Oceans Canada representation from the lower, mid and upper river.

Recommendation 3: Fraser River First Nations Watershed Process

It is recommended that the Fraser River First Nations Watershed process be further supported by ensuring technical support is provided for continued

[4] There is a difference of opinion over whether this should refer to separate inclusion of environmental groups and habitat stewardship/stream keeper groups.

improvements in the efficiency of annual management planning and consultation processes.

Also, support should be provided to coastal First Nations who choose to form an aggregate body representing First Nation communities.

7.3 The Integrated Fisheries Management Plan and Pre-Season Planning

All sectors cited the need for improvement in the fishery management planning process. The perception from outside the Department is that there was a lack of clarity regarding roles at Fisheries and Oceans Canada for management plan development and in-season decision making, and the process for decision-making was slow. Specific issues raised included the concern that decision rules only considered a narrow range of options; they were changed without consultation in-season; and the costs/benefits of each option were not explicitly outlined.

The Integrated Fisheries Management Plan is the principle vehicle for management planning of salmon fisheries. In recent years, draft IFMPs have served as the basis for consultation. Decision rules for a number of fisheries were included in the 2002 fishing plan. However for Late run Fraser River sockeye, decision rules did not explicitly consider returns outside the forecast range. In future, the intent is to develop decision rules that address a broad range of foreseeable circumstances, in order to facilitate in-season changes to fishing plans should that become necessary.

In the same way there is need to have explicit conservation goals, it is necessary to define the socio-economic outcome that is to be achieved as a public policy objective. It is, of course, understood that conservation objectives must be met as the paramount priority, and that addressing food, social, and ceremonial requirements is the first priority after conservation. Within that hierarchy, and consistent with the other principles of the salmon allocation policy, it would be desirable for the Department to define socio-economic objectives as part of the IFMP, and to establish a process that will identify opportunities to promote the stability, opportunity, and the continued viability of the commercial and recreational sectors.

Recommendation 4: Elements of the IFMP

It is recommended that the pre-season development of the IFMP be the focal point for consultation and debate. IFMPs should clearly define the priority of conservation and should also include a number of other key items such as:

- **A description of domestic and international commitments;**
- **Decision rules that will guide in-season management. This would include a science-based risk management framework, with decision tables that illustrate probable effects of a wide range of management options. They would cover a broad range of foreseeable circumstances and would guide the appropriate fisheries management responses to changing**

circumstances (such as in-season estimates of pre-spawning mortality of Late run sockeye); and

- **A description of socio-economic objectives.**

Recommendation 5: IFMP Issues for 2003

Pending completion of a wild salmon policy and completion of long-term escapement goals for Fraser River sockeye, it is recommended that consultations be held with First Nations and stakeholders (including conservation organizations) on escapement targets to guide resource management for the 2003 fishery. As well, there will be consultations on the management objectives for Cultus Lake and Sakinaw Lake sockeye in 2003, relating to both fishing and habitat protection, and other means of stock rebuilding.

Obligations to First Nations for Food, Social and Ceremonial Fisheries

The responses provided by First Nations in this review suggested that, on the whole, management decisions appropriately reflected the priority access for FSC use (after conservation). However, there were up-river First Nations that did not achieve their FSC allocations.

Recommendation 6: Food, Social, and Ceremonial Obligations

All harvesting plans will continue to be designed to ensure that, after conservation objectives have been addressed, priority access for FSC purposes is provided over other uses.

Recreational Fisheries

The recreational sector raised concerns about the regulation of the recreational fishery and provision of provision of stable and predictable opportunities. They protested the necessity of having similar area and timing closures for the commercial and recreational fisheries for Fraser River sockeye on the grounds that such closures were particularly disruptive to the recreational fishery.

Recommendation 7: Regulation of the Recreational Fishery

It is recommended that consultations be initiated with the Sport Fishing Advisory Board to address concerns regarding the regulation of the recreational fishery, its linkage to the First Nations and commercial fisheries, and possible impediments to the provision of stable and predictable opportunities for the recreational harvest of sockeye.

Enforcement

There is widespread concern about the adequacy of enforcement being conducted by Fisheries and Oceans Canada, particularly as there have been repeated incidents of illegal fishing in the Fraser River sockeye fisheries. The recreational sector noted the perception that enforcement activity is inadequate and uneven, and that budget restraint will decrease coverage in 2003. First Nations were of the view that all harvesters who fish without authorization must be dealt with on an equitable basis. The commercial sector indicated that there was inadequate enforcement in all fisheries, and that there needs to be a level playing field for all participants.

With the adoption of a more strategic approach to enforcement it is important to ensure that First Nations and stakeholders clearly understand overall enforcement strategies and priorities, and provide input into their development. As well, the partnership arrangements and protocols related to enforcement are seen as a method for improving compliance.

Recommendation 8: Enforcement

It is recommended that the Department consult with First Nations and stakeholders on enforcement issues:

- **There will be pre-season meetings involving Conservation and Protection staff from Area offices to address anticipated monitoring enforcement issues, coordinated strategies, and priorities.**
- **There will be post-season meetings to review the outcome of these strategies, and progress related to partnership arrangements and protocols.**
- **Partnership arrangements and protocols with First Nations and stakeholders should be developed or improved, wherever possible. These would formalize the shared roles and responsibilities, and could include improved monitoring and catch reporting, co-management issues, or on-ground interactions between the parties.**

As well, external members of the Steering Committee advocate more funding to support enforcement activities related to the conduct of Fraser River sockeye fisheries.

Monitoring and Assessment Studies

In addition, the need for further research into key issues affecting Fraser River sockeye conservation and management was identified. Conservation organizations, the recreational and commercial fishing sectors and First Nations, have each stressed the need for more work on the impact of high spawner densities of sockeye in the Fraser River, and on the migration timing and in-river

mortality of the Late run stock aggregate as a consideration for conservation and future planning of fisheries. Stock assessment studies are conducted annually, and significant funding has been provided to evaluate the in-river mortality problem with Late run sockeye.

Recommendation 9: Monitoring and Assessment Studies

It is recommended that monitoring and assessment studies be continued to improve understanding of the effects of high spawner density (e.g. Adams River 2002) and the migration behaviour and in-river mortality among Late run sockeye.

As well, external members of the Steering Committee advocate undertaking more extensive stock assessment studies on all Fraser River sockeye stocks.

7.4 In-Season Management

There was consensus amongst First Nations and stakeholders that improvement is required to in-season data collection on the abundance and timing of runs. A review of stock assessment programs for Fraser River sockeye, in both marine and freshwater areas, was requested to assess the adequacy for management needs. They also called for a new catch monitoring system to provide real time data on landings. The recreational sector noted that changes in the sockeye fishery have led to substantial changes in the data available for management, and they called for revisions to the process of test fishing. The commercial sector indicated that a process to obtain necessary in-season information is required and expressed concern about the accuracy of data interpretation. First Nations and other sectors identified an urgent need to improve in-season assessment methods to recognize abundance and behaviour in a timely way. Various First Nations expressed a desire to participate in test fisheries, stock assessment, catch monitoring, and observing.

Recommendation 10: In-Season Estimates and Data

It is recommended that the Department work with the staff of the Pacific Salmon Commission, First Nations and stakeholders to develop improved in-season estimates of run size and timing. A number of avenues will be explored to develop these improvements:

- **improvements to existing test fisheries;**
- **development of new test fisheries;**
- **environmental monitoring programs;**
- **use of stock assessment fisheries (conducted on a limited small fleet basis);**
- **traditional knowledge and on-water information will be evaluated as a means of augmenting these information sources; and**

- **the Department should consider a three to five year program designed to optimize use of resources directed at in-season estimates required to achieve management objectives.**

It is also recommended that the Department work with all harvesting groups to improve the accuracy and timeliness of catch reporting, including adoption of a catch monitoring system to provide information on landings.

Facilitating Stock Assessment Fishery

All harvesting groups identified the lack of adequate in-season estimates of abundance and migration behaviour as a critical problem. With fewer full fleet opportunities due to various conservation issues, the ability to estimate in-season abundance has diminished in recent years, indicating a need to explore newer mechanisms to estimate in-season abundance. While not advocating for a return to the large fleet style of test fishing, both the recreational and commercial sector have both called for revisions to the test fishing, that could be done on a limited basis. The current 'trigger' for Fraser River pilot sockeye sales fisheries is the conduct of a Canadian commercial harvest of sockeye. The commercial sector is concerned that proposed stock assessment fisheries (primarily in the approach areas to the Fraser River) utilizing some limited portion of the commercial fleet would not be approved due to concerns that this would also trigger pilot sales fisheries. First Nations, however, are concerned this could result in substantial fisheries that would preclude FSC and pilot sales opportunities. However, they recognize that there is a problem regarding test fishing, and suggested that local First Nations should conduct test fishing, with the catch used for their food, social, ceremonial needs.

Recommendation 11: Facilitating Stock Assessment Fishery

It is recommended that the trigger for a pilot sales fishery be clarified so that the occurrence of stock assessment fisheries (conducted on a limited small fleet basis) that are specifically for the determination of stock abundance and the identification of a Canadian TAC, whether in approach areas or within the Fraser River, would not automatically trigger a pilot sales fishery. Such an assessment fishery would need to be approved by the Fraser Panel, as part of the Pacific Salmon Commission process.

Improved Communication with Recreational Fishery

The recreational sector requested improvements to management and communication to provide more stability within the fishery. Fisheries and Oceans Canada acknowledges the allocation policy commitment to stable and predictable opportunities for the recreational harvest of sockeye, and recognizes that better communications with the recreational fisheries sector are required, including improvements in the timing of opening and closure announcements.

Recommendation 12: Improved Communication with Recreational Fishery

It is recommended that Pacific Region staff consult with the Sport Fishing Advisory Board prior to the commencement of the 2003 management season to identify and implement practical, affordable options that will improve the timeliness and effectiveness of in-season communication and consultation with the recreational fishing community.

Innovative Fisheries

The commercial sector pointed out that the impact of a dramatically reduced fleet should be recognized in evaluating risks associated with fishery openings and in meeting conservation objectives. Notwithstanding the reduced fleet, they accepted that more could be done. They specifically pointed to their role in selective fishing and making fleet adjustments to harvest small TACs.

Recommendation 13: Innovative Fisheries

It is recommended that the Department work with all sectors to adopt innovative means to conduct sustainable fisheries that are consistent with conservation objectives. Where appropriate, conservation organizations should be involved to assist in advising this work.

7.5 Roles and Responsibilities

The commercial sector expressed concern that there is no clear definition of Area versus regional priorities, nor is there a decision structure that can resolve competing interests within the Department. They also expressed concern about the level of involvement of the Department's national headquarters in the decision making process. The recreational sector called for a streamlining of the decision making process to expedite decisions, and they want to ensure that the Department avoids usurping the role of the Fraser River Panel. First Nations and conservation organizations called for the Department to make a clear statement of its role and function, and vigorously uphold domestic international commitments.

The overview of roles and responsibilities contained in Section 3.3 was intended to clarify both international and domestic accountabilities associated with salmon fisheries management. In response to the concerns listed above, it is worth elaborating on several points. First, Fisheries Management at regional headquarters articulates the overall policy framework, provides direction to the Areas on priorities and co-ordinates the development of fishing plans. In turn, the Areas are responsible for in-season management activities in accordance with the approved fishing plans. Canada's international responsibilities associated with Fraser River sockeye salmon fisheries in panel waters are defined by the Pacific Salmon Treaty. The Pacific

Salmon Commission and the Fraser River Panel are Canada's primary vehicles for meeting international responsibilities

Concerns are recognized about the coordination and timeliness of decisions related to in-season management, in particular issues that are not addressed in the IFMP.

Recommendation 14: In-Season Decision Making

It is recommended that the Regional Director of Fisheries Management be assigned the authority and accountability for implementation of the IFMP including coordination between Area offices and dispute resolution, and for other circumstances that are not anticipated in the IFMP.

8. Appendices

Appendix 1: Terms of Reference for 2002 Fraser River Sockeye Fishery Post-Season Review
Appendix 2: Membership on the External Steering Committee and Meeting Dates
Appendix 3: Fishery Management Areas in Southern British Columbia and Washington, including the Fraser River Panel Area
Appendix 4: Fraser River Sockeye Decision Rules
Appendix 5: Detailed Chronology of the 2002 Fraser River Sockeye Fishery

9. Supplementary Documentation

Reports from consultations and written submissions are available upon request.

Appendix 1: Terms of Reference

2002 FRASER RIVER SOCKEYE FISHERY POST-SEASON REVIEW

TERMS OF REFERENCE

1. INTRODUCTION

- The management of the salmon fishery in 2002 was marred by controversy and conflict over harvest management. Most of the debate was directed at management of the Fraser River sockeye, where the following concerns were expressed:
  - Validity of conservation objectives;
  - In-season management processes;
  - Adequacy of data for timeliness of decision making;
  - Consultation pre-season and in-season;
  - Management flexibility in the face of changing circumstances (run size, timing, abundance); and
  - Scientific advice and risk management strategies.

- On September 6, 2002, the Minister met with several groups involved in Pacific salmon fisheries to discuss these issues and he committed to a post season review in response to concerns raised by stakeholders.

2. SCOPE

- The review will focus on Fraser River sockeye management with particular emphasis on consultation processes, conservation objectives, risk management, adequacy of data, process for decision making, and the Department's program management processes.

- The intent is to focus on positive recommendations for the future management of Fraser River sockeye fisheries. Consideration of other salmon fisheries will be conducted through established post-season review processes.

3. PARTICIPATION AND APPROACH

- The conduct of the review will be directed by the Assistant Deputy Minister, Fisheries Management, who will chair an External Steering Committee. The Steering Committee will be responsible for developing the terms of reference for the review, confirming the approach, and it will be updated regularly on progress. In addition, the members of the Steering Committee will coordinate consultations with their sector and Fisheries and Oceans Canada, review progress, and will be asked to review and approve the final report.

- The External Steering Committee will be asked to consider using umbrella organizations for the majority of consultations with First Nations and stakeholders (e.g. SFAB for recreational sector) to facilitate timely input from all groups.

- External Advisors (1 each)
  - Fisheries and Oceans Canada – Regional Director General
  - Province of British Columbia
  - Pacific Fisheries Resource Conservation Council
  - British Columbia Aboriginal Fisheries Commission (Upper/Lower Fraser)
  - Sport Fishing Advisory Board
  - Commercial representative of the Fraser River Panel
  - Canadian Commissioner from the Pacific Salmon Commission
  - Environmental organization

- The Assistant Deputy Minister will also direct an internal dedicated team chaired by the Regional Director General in the conduct of the review. It will be comprised of individuals knowledgeable of the science and management of Fraser River sockeye fisheries. This team will be responsible for the organization of meetings, the preparation of meeting reports, and the drafting of the summary post season report with findings and recommendations on the conduct of the 2002 Fraser River sockeye fishery. Other Departmental officials will be called upon to provide fisheries management and scientific information during the review process.

- The Steering Committee will meet with senior Departmental staff (Assistant Deputy Minister – Fisheries Management, Regional Director General, Regional Director of Fisheries Management) periodically to review reports from the consultative meetings to ensure there is a comprehensive appreciation of the issues advanced by First Nations and stakeholder groups.

4. KEY ISSUES

Validity of Conservation Objectives

- Are conservation-based objectives clear and is harvest rate management the right approach or should alternatives be considered?
- If the harvest rate approach is acceptable, what is required to establish the appropriate level for various return levels?
- Did the 15% harvest rate used this year for late run Fraser River sockeye have scientific justification?

Management Flexibility

- Should the plan cover all management action and require their strict application, or should flexibility be permitted under certain circumstances? What circumstances?
- How could the plan be improved to incorporate a broader range of management scenarios?

- If the Department proved to be overly cautious this season, would there be willingness to revise the management regime to be more flexible in the future?

Scientific Advice and Risk Management Strategies

- Is there and should there be management flexibility (risk) outside the constraint presented by technical models and analyses, or should the models and analyses incorporate a wider range of potential outcomes (in-river mortality, run size variations, etc.)?
- Given the imperative of protecting weak stocks from extinction (*Species at Risk Act*), were there other management options to provide greater fishing opportunities based on more flexible recovery strategies?
- What was the rationale for escapement targets this season?
- What are the pros and cons of escapement in excess of spawning targets?

In-Season Management Processes/Consultation Processes

- What were the roles of Fisheries and Oceans Canada and the Fraser River Panel in the decision making and management of the in-season Fraser River sockeye fishery?
- How was the Canada-U.S. dimension incorporated into the decision making process?
- What was the role of the Fraser River Panel and the Department's Integrated Management Team for in-season management and is that role being fulfilled?
- Adequacy of data timeliness and accuracy for in-season decision making (test fishing, stock identification, fisheries monitoring) should be reviewed.
- How did the Fraser River Panel and the Department respond to unexpected circumstances?
- What were the pre-season decision rules, who was consulted, were they followed in-season, and how did they work in relation to changes in run size?
- What was the involvement of stakeholders in the consultative process in pre-season, in-season, and post season review?
- How were decisions on opening and closing communicated and to whom? Was the process to communicate decisions inclusive and transparent?
- Is the process for making decisions timely for opening and closing fisheries?
- How could decision rules and the process related to their development and implementation be improved?

Enforcement

- How effective was the Conservation and Protection support to the fishing plans for all users?

These questions are illustrative of the issues that people may wish to raise. Others may be considered, in keeping with the scope of the review.

5. WORKPLAN AND SCHEDULE

- Draft terms of reference to be approved by the Assistant Deputy Minister of Fisheries Management by October 21, 2002.
- Memorandum to Minister on the status of the review, and including a copy of the draft terms of reference, by October 24, 2002.
- Appointment of the External Steering Committee by October 29, 2002.
- First meeting of the External Steering Committee, to review and approve the terms of reference for the 2002 Fraser River Sockeye Fishery Post Season Review, by November 4, 2002.
- Meetings with umbrella representative organizations representing sectors, and other groups such as Pacific Salmon Commission staff, and Departmental officials, to be scheduled during November and December.
- Report back to the External Steering Committee on progress to date, by December 16, 2002.
- Draft report to be prepared by January 15, 2003.
- Review of draft report by the External Steering Committee by January 21, 2003.
- Final report and review to be completed by January 31, 2003.

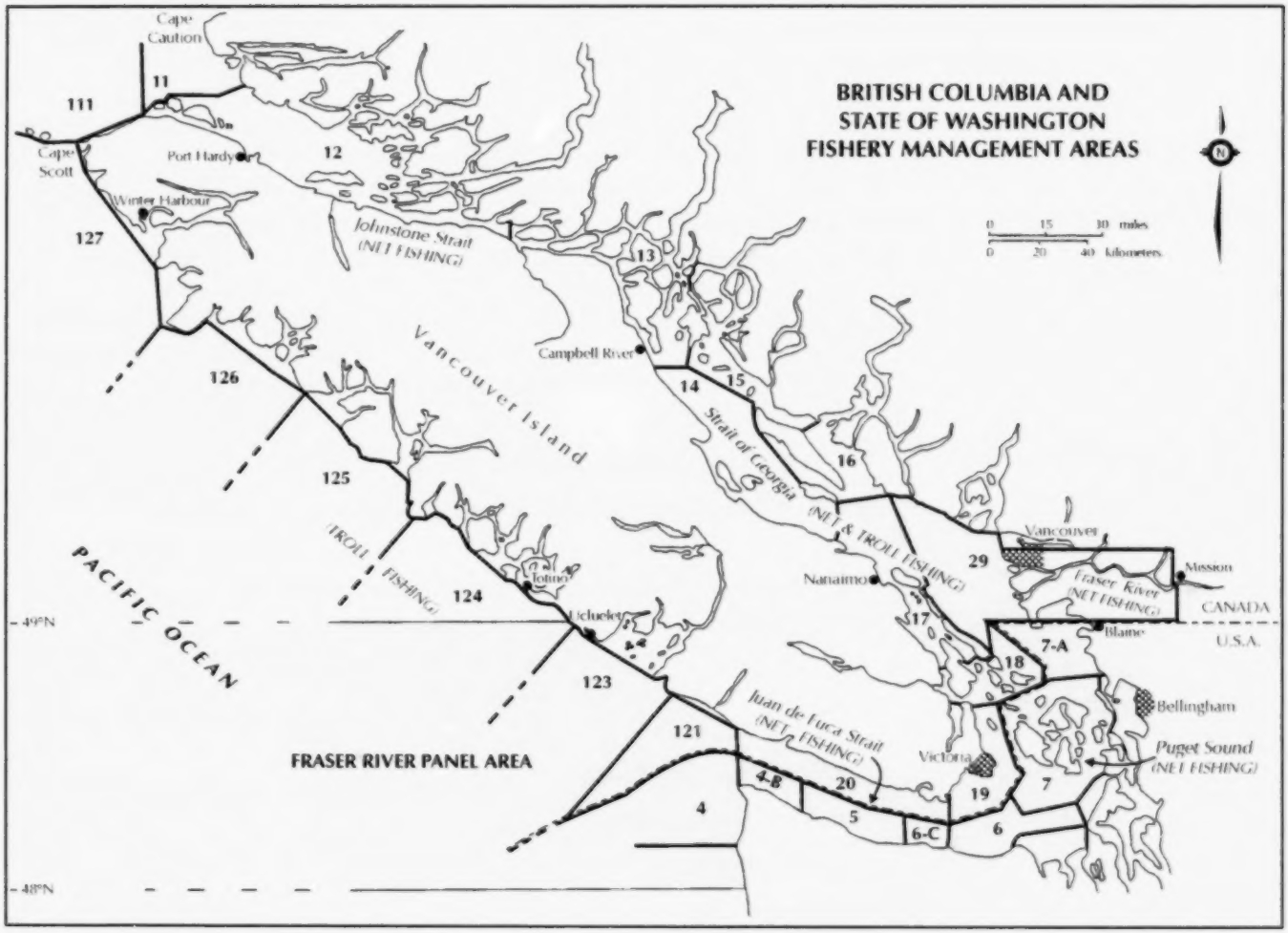
Appendix 2: Membership of the External Steering Committee and Meeting Dates

Membership	Affiliation
P. S. Chamut	Assistant Deputy Minister of Fisheries Management, Fisheries and Oceans Canada
John Davis	Regional Director General of Pacific Region, Fisheries and Oceans Canada
Arnie Narcisse	First Nation Fisheries, British Columbia Aboriginal Fisheries Commission
Ken Maloway	First Nation Fisheries, British Columbia Aboriginal Fisheries Commission
Brian Assu	Commercial Fisheries, Member of the Fraser Panel of the Pacific Salmon Commission; Aboriginal commercial fisher
Gerry Kristianson	Recreational Fisheries, Canadian Commissioner to the Pacific Salmon Commission
Garnet Jones	Commercial Fisheries, Canadian Commissioner to the Pacific Salmon Commission
Terry Glavin	Conservation Organizations, Member of the Sierra Club
Brian Riddell	Scientific Advisor to the Pacific Fisheries Resource Conservation Council
C.C. Graham	British Columbia Provincial Government, Assistant Deputy Minister, Ministry of Agriculture, Food and Fisheries

Meeting Dates

November 4, 2002	External Steering Committee
December 4, 2002	Conservation Organizations
December 10, 2002	Commercial Sector
December 11, 2002	Recreational Sector
December 16, 2002	External Steering Committee
January 9, 2003	First Nations
January 27, 2003	External Steering Committee
February 24, 2003	External Steering Committee
March 3, 2003	External Steering Committee

Appendix 3: Fishery Management Areas in Southern British Columbia and State of Washington, including the Fraser River Panel Area



Appendix 4: Fraser River Sockeye Decision Rules

Potential fishing opportunities for Fraser River sockeye at specified run sizes. Fishery openings will be determined in-season as a function of run size estimates. Numbers followed by a "k" indicates thousands of fish.

Stock Group	un Size	Escapement target	Harvest Rate Guidelines	Potential Catch (All sectors)	FSC	Commercial + First Nations Pilot Sales	Recreational
Early Stuart	Below 75k*	up to 75k	0%	0	Closed*	Closed	Non-directed, Non-retention
	75k to 107k	75k	0 - 30%	Below 32k	Directed	Closed	Non-directed, Non-retention
	107k to 214k	75k	30 – 65%	32k to 139k	Directed	Closed	Non-directed, Non-retention
	Above 214k	Above 75k	65 – 70%	Above 139k	Directed	Closed/Retention	Non-retention/ Retention
Early Summer	Below 267k	up to 227k	0 - 15%	Below 40k	Directed	Closed	Non-retention
	267k to 649k	227k	15 – 65%	40k to 422k	Directed	Retention	Non-retention
	Above 649k	Above 227k	65 – 70%	Above 422k	Directed	Directed	Directed
Summer	Below 2,714k	up to 1,900k	0 - 30%	Below 814k	Directed	Closed	Non-retention
	2,714k to 5,278k	1,900k	30 - 64%	814k to 3,378k	Directed	Directed	Directed
	Above 5,278k	Above 1,900k	64%	Above 3,378k	Directed	Directed	Directed
Late	Below 2,095k	up to 1,781k	0 - 15%		[a]	[a]	[a]
	2,095k to 5,087k	1,781k	15 - 65%		[a]	[a]	[a]
	Above 5,087k	Above 1,781k	65 - 70%		[a]	[a]	[a]

[a] In anticipation of continued high in-river mortality associated with early entry of the Late run into the Fraser River, no directed fisheries on Late run stocks are anticipated and catch will be limited to incidental retention during fisheries for Summer run stocks. In the event that stock assessment indicates that the Late run sockeye are delaying in the Strait of Georgia similar to historical migration patterns (e.g. four to six week delay) then directed fishing opportunities for these stocks may be identified in-season.

*Limited ceremonial opportunities may be provided.

Appendix 5: Detailed Chronology of the 2002 Fraser River Sockeye Fishery

2002 – Fraser River Sockeye Salmon Fisheries Record of Management

1. Pre-Season Forecast & Goals

	Sockeye Stock Groupings					
	Early Stuart	Early Summer	Mid-Summer	(Late Run)		Total
				Birkenhead	"Late Lates"	
Forecast						
50% level	105K	678K	9M	421K	3.2M	**13.4M**
75% level	59K	326K	5.2M	227K	2.1M	**7.9M**
Escapement Goal						
50% level	75K	227K	3.2M	2.9M		**6.4M**
75% level	59K	227K	1.9M	2.0M		**4.1M**
Long Term/Interim Goal						
	200K	399K	3.6M	4.3M		**8.5M**

2. Pre-Season Plan

For specific dates and areas, please refer to the following Appendices:

- ***Appendix 1 - 2002 Fraser River Commercial & Recreational Sockeye Openings – Canada***
- ***Appendix 2 - 2002 Open Times for Lower Fraser River First Nations Sockeye & Pink Fisheries (Fraser River Mouth to Sawmill Creek)***
- *Appendix 3 - 2002 Open Times for the Upper Fraser River First Nations Fisheries (above Sawmill Creek)*
- ***Appendix 4 - 2002 Fraser River Recreational Sockeye Openings – Canada***

Model Parameters

- Based on 50% probability run size forecasts with an exploitation rate ceiling of 64% on Summer Run stocks & 15% maximum exploitation rate on Late Lates (i.e. Late Run minus Birkenhead component).
- Models assume 100% early migration of Late Lates and 90% mortality on all early migrating fish.
- Run timing of each stock group was assumed to be normally distributed with Peak run timing in area 20 by group as follows:

Early Stuart:	July 3
Early Summer:	July 25
Summer:	Aug. 4
Late:	Aug. 20

- Predicted total return of all stock groupings: 13.4 M (50p) 7.9M (75p)
- Pre-season diversion prediction of 25% through Johnstone Strait
- Commercial catch modelled:
  - US modelled catch: 1.0 M
  - Canadian modelled catch: 4.4 M
- Gross escapement modelled: 7.5 M

Canadian Pre-Season Plan as per Model 50-47B:

	Days of Fishing				
	Purse Seine "B"		Gillnet "D"	"E"	Troll "H"
Week ending	JoSt	A20			JoSt
3-Aug	4	4	6	1	6
10-Aug	4	4	6	2	6
17-Aug	2	3	2	2	2
24-Aug				1	
total days	10	11	14	6	14

US Pre-Season Plan as per Model 50-47B:

	Days of Fishing		
	Treaty Indian		Non-treaty Ind
Week ending	4B/5/6C	7/7A	7/7A
27-Jul	5		
3-Aug	5	1	
10-Aug	5	1	1
17-Aug	5	1	1
total days	20	3	2

Pre-Season Consultations

- Fraser Watershed Aboriginal Fisheries Forum – March 2002

3. Actual Commercial Fishing Times

Canadian Commercial Fishery Times

	Days of Fishing/hours (Date of Fishery)						
	Purse Seine		Gillnet			Troll	
	"B"		"D"	"E"	"G"	"H"	
Week ending	JoSt	A20				JoSt	A18/29
3-Aug	12hr(1)	15hr(1)	5d(30-3)	3hr (1)	7d (28-3)	4d (30, 31,2,3)	1d (3)
10-Aug			2 (4, 10/11)	3hr (6)		3 (4,5, 10)	3 (4,5, 10)
17-Aug	6h (12)	8hr (12)		2 (12, 14)		1 (11)	1 (11)
24-Aug							
31-Aug			1 (28/29)			2 (29, 30)	
total days	2	2	8	4	7	8	5

US Fishery Times

	Days of Fishing				
	Treaty Indian		Non-treaty Indian		
Week ending	4B/5/6C	6/7/7A	Purse Seine	Gillnet	Reefnet
27-Jul	7 (21-27)				
3-Aug	6 (29-3)	2 (31, 3)	1 (2)	1 (2)	1 (3)
10-Aug	7 (4-10)		1 (8)	1 (8)	3 (4,5,10)
17-Aug	2 (11-12)	1 (11)		1 (12)	
24-Aug				1 (24)	
31-Aug				2 (25,26)	
total days	22	3	2	6	4

4. Details of 2002 Fishing Season

July 5, 2002 – F - Fraser River Panel (FRP) call

	Sockeye Stock Groupings				
	Early Stuart	Early Summer	Mid-Summer	(Late Run)	
				Birkenhead	"Late Lates"
50% forecast (esc. goal)	105K	679K	9M	421K	3.2M
75% forecast (esc. goal)	59K	326K	5.2M	227K	2.1M

- A20 test fishery was shut down on 1-Jul due to low numbers of sockeye and large numbers of dogfish encountered. Will restart July 7th.
- Model estimates for Early Stuart range from 20K-49K
- 50% forecast timing for Early Stuart at Mission of July 6.
- Diversion rate forecast of 27% through Johnstone Strait
- High discharge at Hope – peaked at 9600 cms on 1-Jul; down to 8600 cms on 5-Jul

July 9, 2002 – Tu - Fraser River Panel (FRP) call

	Sockeye Stock Groupings				
	Early Stuart	Early Summer	Mid-Summer	(Late Run)	
				Birkenhead	"Late Lates"
50% level	105K	678K	9M	421K	3.2M
75% level	59K	326K	5.2M	227K	2.1M
Panel approved	**60K***				

* Early Stuart run size estimate of 60K is provisional (for management purposes) – to be discussed next meeting with respect to potential en route loss and spawning escapement numbers

- Area 20 test fishery started up again on 7-Jul, caught 703 sockeye - 67% Lk Washington: 28% Early Stuart: 5% Early Summer based on scale samples
- Discharge at Hope dropped to 7500 cms
- Model estimates for E. Stu range from 45-64K
- PSC recommended & Panel adopted Early Stuart run size estimate of 60K as Whonnock CPUE is low due to high water, sockeye observed in the river prior to start of test fishing
- Observed peak migration date 7-Jul at Mission
- Lake Washington sockeye are tracking 6 days early, and above forecast

July 12, 2002 – F - Fraser River Panel (FRP) call

	Sockeye Stock Groupings				
	Early Stuart	Early Summer	Mid-Summer	(Late Run)	
				Birkenhead	"Late Lates"
50% level	105K	678K	9M	421K	3.2M
75% level	59K	326K	5.2M	227K	2.1M
Panel approved	60K				

- Early Stuart timing seems to be closer to the long term average (i.e. July 3/4 peak) rather than Al Cass' forecast of 30-Jun
- some of the interpolated fish from before the test fishing started haven't shown up in-river, so the PSC has revised their estimates of fish passing by prior to test fishery commencement downward
- As a result of all of the above, there has been NO CHANGE to the Early Stuart run size estimate of 60,000
- Environmental (water discharge) conditions continue to improve and are at levels considered "benign"
- the Environmental Management Adjustment will be used this year BUT each management adjustment change will be vetted through the FRPTC and the FRP before being incorporated into the gross escapement estimate

July 16, 2002 – Tu - Fraser River Panel (FRP) call

	Sockeye Stock Groupings				
	Early Stuart	Early Summer	Mid-Summer	(Late Run)	
				Birkenhead	"Late Lates"
50% level	105K	678K	9M	421K	3.2M
75% level	59K	326K	5.2M	227K	2.1M
Panel approved	60K				

- Note that the Pitt sockeye are being included in the Fennel-Bowron Stock ID % this year
- Preliminary estimate for Early Summers likely next Tuesday for the early timed Early Summers. We are about 1 week away from the Early-Timed Early Summer peak and they are about 2 days late if they're coming in at the 50p level.
- Temperature and discharge have both increased since last Friday. 7000cms @ Hope and about 16C at Qualark
- There seems to be an absence Summer run fish – potential late arrival and/or smaller run size sign

July 19, 2002 – F - Fraser River Panel (FRP) call

	Sockeye Stock Groupings				
	Early Stuart	Early Summer	Mid-Summer	(Late Run)	
				Birkenhead	"Late Lates"
50% level	105K	678K	9M	421K	3.2M
75% level	59K	326K	5.2M	227K	2.1M
Panel approved	60K				

- Environmental conditions stay benign - expecting 5000 cms and 17.7C by 26-Jul
- Early timed Early Summers (excluding Scotch/Seymour) are either 2 days late at the 50p level or coming in at the 75p level if following long term average timing (as opposed to the 50p of 678K)
- Al Cass' forecast for Chilko timing has the peak on August 8 (A20 date), which is 5 days later than the long term average
- Discussion around when to start fisheries (i.e. marine area stock proportions, abundance & Mission escapements) & what to use as a cut-off date (15-Aug suggested as cut-off date by PSC to protect the

Late run). The discussion of a cut-off date related to the modelling done in the pre-season plan and the rationale for its use, in-season.

- US Area 4B/5/6C fisheries are fishing for 3 days starting 21-Jul at noon; continuance subject to review on Tuesday's call. Rationale as follows:
  - predomination of summer run%
  - low impact fisheries (max of about 12 boats)
  - hoping to get some sort of assessment info (qualitative, if not yet quantitative)
  - follows the pre-season guidelines IF we use the new Chilko forecast
  - CDN agreed to US fisheries and has decided to "save" their Early Summer TAC for a time when more Summers can be harvested
- Environmental Mgmt Adjustment ... more debate, no change in pre-season mgmt adjustment of 87K on Early Summers, yet. The Panel adopted an approach for the in-season use of the EMA model, but there is not yet enough data available (days of temp/water levels) to implement the model.
- Canadian FSC fisheries for sockeye in the Lower Fraser to begin today, July 19
- US Fishery proposal amended to 3 days (from 5) after PSC expressed concern regarding risk of harvesting too many Early Summer sockeye prior to the arrival of larger numbers of Summer run fish.

Area/Group	Decisions
B	
D	
E	
G	
H	
Recreational	
FSC	
Sel. Fish.	
US	4B/5/6C – open noon 21-Jul to noon 24-Jul to Drift Nets

July 23, 2002 – Tu - Fraser River Panel (FRP) call

	Sockeye Stock Groupings				
	Early Stuart	Early Summer	Mid-Summer	(Late Run)	
				Birkenhead	"Late Lates"
50% level	105K	678K	9M	421K	3.2M
75% level	59K	326K	5.2M	227K	2.1M
Panel approved	60K				

- total estimated Early Stuart run is about 62K (61K past Mission, 1K in catch)
- early timed Early Summer component is either tracking between the 50% and 75% p-levels, depending on the model and the timing assumption used.
- the 4B/5/6C fishery caught 263 sockeye for 7 boats on its first night; 348 for 5 boats on second night
- in-river projection from Fri-Mon was 48K, got 35K
- FR FSC catch from mouth to Sawmill over the weekend: 6200 sockeye, of which ~1000 were estimated to be E. Stuart
- PSC is having a bit of trouble with stock ID - they believe that they are attributing more fish to Early Summers than they should be and short changing the Summers. PSC staff also informed Panel that DNA analyses would be used to revise the scale-based stock ID results.
- High percentage of 5 year olds in A20 & Johnstone Strait
- What little info we have on the Summers have them tracking the 75p & 5 days late forecast
- Environmental Conditions: 6000cms @ Hope; 16.8C @ Qualark; 17.7C @ Nechako
- A20 2nd boat (at Sherringham) started yesterday 23-Jul
- note - the "Controlled Low-Impact fisheries for the Purpose of..." [CLIPped] fisheries is the name given to what has previously been known as "small bite"

- Canada requested an FRP meeting on the day the Early Summer run size estimate can be made; no proposals for commercial/recreational fisheries
- US proposes to extend 4B/5/6C fishery from noon Wed to noon Sat; maximum of 16-18 vessels

Area/Group	Decisions
B	Full fleet earliest oppt'y 28-Jul
D	CLIPped fshy – 10 vessels – poss. 25 or 26-Jul to be confirmed 24 or 25-Jul Full fleet earliest oppt'y 27-Jul
E	Full fleet earliest oppt'y 29-Jul
G	CLIPped fshy – 4-6 vessels – poss. 25 or 26-Jul to be confirmed 24 or 25-Jul Full fleet earliest oppt'y 26-Jul
H	CLIPped fshy – 8 vessels – poss. 25 or 26-Jul to be confirmed 24 or 25-Jul Full fleet earliest oppt'y 27-Jul
Recreational	Tidal – earliest oppt'y 26-Jul FR (tidal & non-tidal) – earliest oppt'y 28-Jul
FSC	
Sel. Fish.	Area B – poss. 25 or 26-Jul to be confirmed 24 or 25-Jul
US	4B/5/6C fisheries have been extended until noon Saturday 27-Jul

July 26, 2002 – F - Fraser River Panel (FRP) & CDN Caucus

	Sockeye Stock Groupings				
	Early Stuart	Early Summer	Mid-Summer	(Late Run)	
				Birkenhead	"Late Lates"
50% level	105K	678K	9M	421K	3.2M
75% level	59K	326K	5.2M	227K	2.1M
Panel approved	63K				
US TAC share	-	17.7K	458.7K	7.7K	43.7K
US CTD	-	-	-	-	-
US Balance					
CDNTAC share	3K	147.3K	2780.2K	44.4K	263.3K
CDN CTD	-	-	-	-	-
CDN Balance					
FSC Balance	3K	97.3K	785.0K	13.3K	96.2K
% of L.Lates harvested to date (in total)					
% of L. Lates harvested to date (excluding in-river catch)					

NOTE: TAC, CTD & Balance info is taken from the Canadian July 26th TAC table

FRP Bilateral

- sockeye are building in abundance in approach waters - especially in Southern approach waters - which is consistent with later Summer timing (5 days late for Chilko; 3 days late for Quesnel)
- the early timed Early-Summers continued to track between the 50 and 75% p-levels, the Semour/Scotch stock group was tracking closer to the 50% p-level
- Average weight of fish is huge (over 6lbs), yet there are more 4yrs than 5 yrs - probably because Scotch-Seymour and Quesnel fish are bigger than average fish
- Staff indicated that scale based stock id models may be overestimating Early Summer relative to Summer run in marine areas, but not in the river. Recommend using a bias correction based on DNA samples
- Staff suggested that we hold off fisheries until Monday as by then we would know more re: Mission escapements (i.e. if A20 projected numbers come into river) and, if fisheries are delayed, will be able to use E. Summer TAC to more advantage (i.e. more Summers per E. Summer)
- Current calculated diversion rate by PSC staff is 22%

- Environmental Conditions:
  - 5300 cms @Hope
  - 17.2C Qualark
  - 19.2C Nechako
- Environmental forecast – increase Temp (with a few days over 17.8C; decrease discharge
- PSC recommended & Panel approved: 43K E. Summer EMA based on benign conditions
- Fishery Cut-off Date
  - Panel agreed to pre-season decision rules:
    - 50p Late Run size estimate
    - 15% harvest ceiling
    - fishery cut-off date (no date decided on)
    - decision rules re: big or early → early, etc.
  - PSC staff recommended a cut-off date of 15-August in Area 20 (2359hrs) to end fisheries (i.e. 15% harvest ceiling reached or 15-August, whichever comes first). Panel did not approve.
- Proposal to have an experimental Panel approved Area G troll test fishery (~6 vessels) to gather DNA and ID presence of sockeye & coho – later withdrawn.
- Area 20 Additional test vessels will not be starting until Monday 29-Jul at earliest because of concerns for E. Summers
- Late Run tagging to start 10-Aug
- CAN-no recommendations for panel waters fisheries; area G troll in Areas 124 - 127 to start July 28 at 0001.
- US- no recommendations for panel waters fisheries; area 4B,5,6C fisheries to end July 27 as planned
- PSC advised Panel not to wait too long to initiate fisheries due to Late run harvest constraints

- Area B
  - May not be able to open Johnstone Strait & A20 at same time – Johnstone Strait may open first (NOTE: Johnstone Strait fisheries will open at same time throughout the season regardless of fishery duration – 0600 hrs start)
  - Selective fisheries – anticipated start Tuesday (30-Jul), confirm Monday re: retention allowed or not
  - Full fleet – earliest on Thursday (1-Aug) – not sure which areas (start time for A20 is not as impt as for Johnstone Strait)
- Area E
  - Possible CLIPped fishery Thursday (1-Aug) – short duration (0800 start for 4 hrs minimum), short net (100 fa), full fleet
  - Next announcement Monday
- Area H
  - 30-Jul full fleet fshy anticipated in Johnstone Strait
  - CLIPped fshy for 28 & 29 – Jul
- Area D
  - 0800 30-Jul full fleet anticipated
  - CLIPped – 1800hrs 27-Jul to 0800 hrs 29-Jul
- Recreational
  - Ocean fisheries to open
  - FR – expect to open next weekend unless Area E opens sooner

Area/Group	Decisions
B	
D	
E	
G	0001hrs 28-Jul in Areas 124 through 127
H	
Recreational	Open 29-Jul in marine waters (excl. tidal waters of FR)
Pilot Sales	
Sel. Fish.	Area B – 30 & 31 – Jul (decide on Monday whether they will be able to keep sockeye)
US	4B/5/6C to close as scheduled (27-Jul)

July 29, 2002 – M - Fraser River Panel (FRP)

	Sockeye Stock Groupings				
	Early Stuart	Early Summer	Mid-Summer	(Late Run)	
				Birkenhead	"Late Lates"
50% level	105K	678K	9M	421K	3.2M
75% level	59K	326K	5.2M	227K	2.1M
Panel approved	60K	160K*			

* 160K is a provisional run size estimate of the Early Summer (excluding Sco/Sey) for management purposes

FRP Bilateral

- FRP adopted 160K estimate for the Early timed portion of the Early Summer run as a provisional estimate (for management purposes) The Seymour/Scotch stock group continues to track close to the 50% p-level
- Summers – PSC estimates that the return is tracking closer to the 75p than 50p
- Environmental conditions:
  - Qualark 28-Jul 18.3C
  - Hope 5100 cms 29-Jul
  - Nechako 18.7C (i.e. has decreased – prob. related to incr. discharge by Alcan)
- PSC staff are using 5d late for Chilko & 3d late for Quesnel
- CDN & US fishery recommendations – PSC expressed concern re: lack of Sco-Seymour run size estimate. However, the US & CDN fishery proposals are okay (there is some concern re: pacing of the US fisheries in case Early Summers come in less than the 50% forecast)
- First E. Stu sockeye seen in Ft. St. James

Area/Group	Decisions
B	01-Aug 0600-2100hrs in Areas 20-1,3,4 (coho encounter limit of 2K)
D	0800 30-Jul to 0600 01-Aug
E	01-Aug CLIPped fishery to catch 30K (probable start 0800) max 6 hr opening
G	Stays open UFN (may extend area to include 123, 111, 112)
H	0001 hr 30-Jul to 2359 31-Jul in A12/13 3/4-Aug in A18/29
Recreational	FR mainstem to open Friday 2-Aug. Marine open UFN.
Pilot Sales	Start noon 2-Aug OR 3-Aug
Sel. Fish.	Area B – A20 2 boats for 2K for 4 days
US	4B/5/6C – 1600 hrs 29-Jul to 1200hrs 2-Aug 6/7/7A – 0400 hrs to 2000 hrs 30-Jul

August 01, 2002 – Th - Fraser River Panel (FRP) call

- US convened call to propose a fishery (which CDN accepted):
  - 7/7A 02-Aug 0900 to 1500hrs for PSn and 1600 to 2200hrs for GN

August 02, 2002 – F - Fraser River Panel (FRP) in-person

	Sockeye Stock Groupings				
	Early Stuart	Early Summer	Mid-Summer	(Late Run)	
				Birkenhead	"Late Lates"
50% level	105K	678K	9M	421K	3.2M
75% level	59K	326K	5.2M	227K	2.1M
Panel approved	60K	550K	(9M in table)	(421K in table)	(3.2M in table)
CDN TAC avail	0				
PSa TAC avail	0				
US TAC share	-	28K	847K	31K	59K
US CTD	-	-	-	-	-
US Balance					
CDNTAC share	3K	206K	4827K	176K	383K
CDN CTD	-	-	-	-	-
CDN Balance					
FSC Balance					
% of L.Lates harvested to date (in total)					
% of L. Lates harvested to date (excluding in-river catch)					
% of L.Lates harvested to date (in total)					
% of L. Lates harvested to date (excluding in-river catch)					

NOTE: TAC, CTD & Balance numbers are from PSC table dated Aug 02

FRP Bilateral

- Late Lates:
  - presence observed as early as July 8th but initially thought to be due to stock ID bias.
  - 14-Jul – small % presence of Late Lates
  - 24-Jul - % of Late Lates started to increase
- further proof of existence of Lates: in river test fisheries have some fish which are shedding scales i.e. are not yet maturing to the point where they have started re-absorbing scales. This is of note as deciduous (shedding) scales are a sign of sexually immature fish which would be consistent with very early returning Late-run stocks.
- PSC is now only using DNA for stock ID, as scales cannot differentiate between Late Lates and Scotch-Seymour
- PSC indicated that Summers and Lates may be more overlapped with respect to migration timing than expected
- Late Run tagging study will be starting this weekend – group did a "dry run" earlier in the week, and this went well
- FRP adopted an Early Summer Run size estimate of 550K for the entire stock aggregate
- PSC staff suggested the Summer Run run size estimate would reach or exceed the 75% p level, but still less than 50% p level.
- FRP has decided not to adopt the 79K EMA for E. Summers based on the questionable weather forecast. It was decided to wait until the next meeting when there will be more days of real data to base a forecast on

FRP Bilateral

- Fishery Proposals – US & CDN proposals accepted as below – some discussion wrt Area H:
  - Original proposal Area H to fish in A18-1, 4, 5, & 11 & A29 with a max catch of 20K 0001hrs 3-Aug to 2359 hrs 4-Aug
  - A18-5 was removed due to Bedwell Harbor area – contains an "Interim Rockfish Conservation Area"
  - PSC: estimates that 50:50 ratio of Summers: Lates in Gulf and that the trollers would harvest a minimum of 10K Late Lates – prob closer to 75% as Lates are more vulnerable to troll gear
    - Estimate that 1/3 of Lates may be delaying in Gulf and that this fishery will be fishing into future returns if it is catching those fish which are delaying
    - A18 is not a holding area – estimated. catch of 4K Late Lates by troll
- Area H proposal was amended to exclude A29, with no catch limit, assuming Late % in A18 ~20%
- US raised concerns that due to budget, would CDN be able to meet obligations as outlined in memorandum re: spawning escapement assessment & enhancement facilities (?)
  - CDN: CDN has committed to fulfil its obligations as noted in the memorandum – details to come – preparations are under way, but no one is in the field, yet.
- Test Fisheries
  - PSC has stopped retaining fish in A20 because they have caught all pay fish
  - Need to retain again to pay for Johnstone Strait tagging platform
  - Test fishing impacts for Late Lates has increased from pre-season estimate because didn't expect there to be any Lates in the mix when they took pay fish
  - PSC is looking at remaining test fisheries and seeing if any of them can be reduced

Area/Group	Decisions
B	
D	Continue to 0600hrs 4-Aug (manage to 50K target)
E	0800 6-Aug for TBA hours 50K target catch (100 fa nets)
G	To close 2359hrs 3-Aug
H	0001 hrs 3-Aug to 2359hrs 5-Aug in A18-1, 4, & 11 (subject to review on 5-Aug)
Recreational	Review on Tuesday 6-Aug
Pilot Sales	0800-2100hrs each day 3&4-Aug
Sel. Fish.	
US	4B/5/6C – TI net – 2-Aug to noon 5-Aug 6/7/7A – TI – 0600hrs 3-Aug to 2300hrs 3-Aug reef nets – 0500 – 2100 hrs each day Aug 3-5

August 05, 2002 – M - Fraser River Panel (FRP)

	Sockeye Stock Groupings				
	Early Stuart	Early Summer	Mid-Summer	(Late Run)	
				Birkenhead	"Late Lates"
50% level	105K	678K	9M	421K	3.2M
75% level	59K	326K	5.2M	227K	2.1M
Panel approved	63K	550K			

FRP Bilateral

- Summers
  - Has been a bit of a drop off over the past few days
  - Models are consistently estimating numbers between 50p & 75p and five days late
- Lates
  - Numbers continue to climb

- Approximately 30 Cultus sockeye to date at fence (i.e. 2 weeks earlier than earliest time seen previously)
- PSC uses A20 DNA results to apply to US fishery
- Late Run assumption policy to date: each fish regardless of migration timing has an equal chance to survive to spawn – no real evidence either way to date
- Estimate of what's holding in the gulf – PSC is not sure, could be as high as 300-400K
- Gulf troll test fishery may start this Wednesday & have results for next Friday Panel mtg BUT this info only becomes useful if policy on Late Run and presumed mortality changes
- 1979 – also had a very early migration BUT fish delayed as they have in all years prior to 1996. *Some* fish could have moved in early in small numbers in earlier years, but don't know

- Decisions made to:
  - Continue with planned Area E on 6-Aug
  - Area H closing as sched
  - Recfish closure 2359 8-Aug
  - PSales to go 7-Aug for some length of time
- Discussion re: CDN desire to change Late-run harvest policy to limit "over-escapement" of Summers as well as in response to very early arrival of Lates and the high probability of large-scale pre-spawn mortality. This is a change from pre-season planning as well as from CDN policy over past few years.

Area/Group	Decisions
B	
D	
E	Portion of 29-9, 11 and 17 open 6 hrs Aug 6 from 08:00 to 11:00 using 100 fathom nets
G	
H	Area 18-1, 4 and 11 continue to 23:59 Aug. 5
Recreational	To close 2359 8-Aug
Pilot Sales	7-Aug for some duration
Sel. Fish.	
US	No add'l fisheries from last week Expect some CNS fisheries to go ahead this week

August 06, 2002 – Tu - Fraser River Panel (FRP) call

	Sockeye Stock Groupings				
	Early Stuart	Early Summer	Mid-Summer	(Late Run)	
				Birkenhead	"Late Lates"
50% level	105K	678K	9M	421K	3.2M
75% level	59K	326K	5.2M	227K	2.1M
Panel approved	63K	550K			

FRP Bilateral

- E. Summer
  - May increase run size estimate on Friday
  - Env't Mgmt Adjustment:
    - EMA estimate dropped to34,000 for Early Summers
    - Panel will decide how to implement the EMA at the August 9 meeting
- Summers
  - Declining abundance continues
  - Staff concerned because run size estimate is very sensitive to timing assumptions; expect a run size of at least 75% p level
- DNA from earlier Whonnock samples were mostly Harrison fish – haven't seen any sockeye in the Harrison, yet

- Tagging Study
  - Most receivers are in place
  - Tagging has started and is well under way
  - 249 tagged to date
  - estimate 30% tagging assoc morts
  - estimate 30% fishing morts
- PSC Test Fishing
  - Looked at different ways to reduce Late-run harvest impacts by ending test fishing programs early and limiting harvest in remaining programs
  - A20 GN end tonight
  - Round Isl. GN end tonight
    - Usually run GN tests through to 24-Aug – are being used now only for info on Sco-Sey & remaining E.Summers
  - A29 Gulf troll – will finish keeping fish as of tomorrow – will only keep fish for samples
  - A20 PSn – only keep fish for samples
  - Estimate 37K Late Lates for entire season
  - CAN and US propose fisheries for panel waters as below.

Area/Group	Decisions
B	
D	
E	6-Aug 0800 – 1100 hr
G	
H	
Recreational	
Pilot Sales	Musqueam 7-Aug Tsawassen 8-Aug (likely)
Sel. Fish.	Poss. going fwd with A20 for 5K & Johnstone Strait for 4K
US	4B/5/6C – 6-Aug 1600hr to 9-Aug 1200hr – 11K catch target 7/7A – comm'l NTI – 8-Aug (estimated catch 25K) w. use of Iverson-Dock Line PSn 1400-1500hr GN 1600-2000hr Treaty CNS fisheries – 6-Aug for 2 days (target 17K) reassess after 2d likely 1-2 PSn vessels

August 08, 2002 – Th - Fraser River Panel (FRP) call

	Sockeye Stock Groupings				
	Early Stuart	Early Summer	Mid-Summer	(Late Run)	
				Birkenhead	"Late Lates"
50% level	105K	678K	9M	421K	3.2M
75% level	59K	326K	5.2M	227K	2.1M
Panel approved	63K	550K			

FRP Bilateral

- Summer Run
  - Tracking close to 50% p-level – no official recommendation; run size models producing estimates from 5.3 to 8.0M
- Late run
  - Tracking close to the 75% p-level (at least) no run size recommendation; models producing estimates from 1.9 to 5.0M

- Quite a difference in A12 & A13 test catch numbers. Why? Env't conditions? Fish not moving? → Lates move slower
- CDN Proposal (of Options) for a new approach to Late Runs
  - Given the appearance of Late Run sockeye in approach waters and into the FR earlier than expected and about two weeks earlier than even in recent years
  - Desire to harvest Summer run surplus and reduce potential for spawning ground problems due to excessive numbers
  - Assume that the sockeye arriving early will die in numbers similar to or exceeding those seen in the Weaver terminal area mark-recapture project in 2001 ie, approaching 100% pre-spawn mortality
- US Response
  - Don't think that *all* of these fish would have died
  - Propose counting at least a portion of those caught to date (maybe discount 50% marine fisheries & all in-river prior to 16-Aug)

August 09, 2002 – F - Fraser River Panel (FRP) in-person

	Sockeye Stock Groupings				
	Early Stuart	Early Summer	Mid-Summer	(Late Run)	
				Birkenhead	"Late Lates"
50% level	105K	678K	9M	421K	3.2M
75% level	59K	326K	5.2M	227K	2.1M
Panel approved	63K	700K	8.0M		4.3M
CDN TAC avail	0				
US TAC share	-	32.5K	461.3K	28.5K	68.4K
US CTD	1.9	56.3	175.8	0.3	27.7
US Balance	-	-	265.8	27	37.8
CDNTAC share	3K	226.5K	2752.5K	160.5K	434.6K
CDN CTD	1.9	137.9	57239	2.6	199.3
CDN Balance	1.1	88.1	2172.3	157.7	233.3
FSC Balance	1.1	43.3	429.1	19	15.3
% of L.Lates harvested to date (in total)					
% of L. Lates harvested to date (excluding in-river catch)					
% of L.Lates harvested to date (in total)					
% of L. Lates harvested to date (excluding in-river catch)					

NOTE: CDN planning, TAC, CTD, & Balance numbers are taken from the CDN TAC table "Aug 9 – 8am-4M Lates"

FRP Bilateral

- Late Run
  - run size estimate is highly dependent on the peak time assumption
  - Estimates between 3.36M & 8.43M
  - No official run size estimate
- Summer run size estimate 8.0M accepted by Panel
- E. Summer run size estimate of 700K accepted by Panel
- PSC informed Panel that it did not have enough information to permit a Late-run run size estimate to be made.
- CDN proposed and the US accepted a Late Lates Run provisional run size estimate of 4.3M
- CDN proposal: assume Late entering FR up to and incl 17-Aug experience 100% pre-spawn mortality, assume that there is some unknown % of Lates holding in Gulf. CDN will provide US share of fish caught in FR prior to 18-Aug → accepted by Panel (as modified by discussion)

- How did we get to 17-Aug?
  - based on extrapolation of Weaver sockeye mark recapture program in 2001
  - for the tagging period from 17-Aug to 24-Aug:
    - Only 6% of tagged fish were recovered in the Weaver system (e.g. assumed 94% enroute mortality)
    - None of the females who arrived spawned (e.g. 100% PSM of survivors)
    - Take mid-point between 17-Aug and 24-Aug (e.g. Aug.20)and walk it back (e.g. 3 days earlier)_to when sockeye entered the Lower Fraser River to obtain Aug. 17 date for discounting fish for calculation of late run exploitation rate
- Fishery Proposals (as in below table)
- PSC: warns that we are starting to apply fisheries on top of high Late Run proportions and would like to make sure that all fisheries going forward will be carefully monitored and controlled. Preference is for small fisheries to be expanded rather than large fisheries contracted.
- Staff caution about risk of exceeding late run allocation in area B because effort is difficult to control
  - Rough calc'ns by PSC estimate that catch of L.Lates: 180K
  - Assessment of planned fisheries:
    - Area B is risky
    - fisheries in Area H could result in a directed Late Run harvest
- Early Stuart fence count update – all 3 tributaries which had a fence in 1998 have already exceeded brood year counts
- US expressed concern re: cuts to DFO spawning escapement programs (among other things) – CDN plans on fulfilling treaty obligations re: spawning escapement information

Area/Group	Decisions
B	Johnstone Strait 0600 – 1200 hrs 12-Aug A20 – controlled fisheries – 0600 to 2100hrs 12-Aug (time will likely be decreased) Target catch for all of Area B = 300K
D	0600 10-Aug to 1800 11-Aug w. goal of 100K.
E	12-Aug 0700-2000hr w. boundaries limited to avoid Gulf
G	
H	0001 10-Aug for 2d in areas 12; 13; 18-1,4&11 expected catch 50K
Recreational	To remain open except for 29-1 through 29-10
Pilot Sales	
Sel. Fish.	
US	4B/5/6C 1600hr 9-Aug to 13-Aug (PSC has concerns – CDN accepts) 6/7/7A – 12hr 11-Aug net fisheries 0530 start w. Iverson-Dock line in place Reefnet-0500 to 2100 10-Aug (5K expected catch) Gillnet – 12-Aug 1600 – 2000 hrs (30K max catch)

August 12, 2002 – M - Fraser River Panel (FRP)

	Sockeye Stock Groupings				
	Early Stuart	Early Summer	Mid-Summer	(Late Run)	
				Birkenhead	"Late Lates"
50% level	105K	678K	9M	421K	3.2M
75% level	59K	326K	5.2M	227K	2.1M
Panel approved	63K	800K	7.0M	227K	4.0M

FRP Bilateral

- Estimate of 800K E. Summer Run accepted by Panel
- Estimate of 7.0M Summer Run accepted by Panel
- Estimate of 4.0M Late Lates Run Size accepted by Panel
- Estimate that the diversion rate is now 70% Northern Diversion

  - Diversion rate isn't used in models calculating run size
  - Using 200 (Johnstone Strait) & 500 (A20) expansion lines
- PSC suggest and Panel accepted using 75p for Birkenhead, as the numbers coming back do not support a 50p return
  - Have not resolved how to treat Birkenhead in TAC table
    - Will be diff to deal with because #s are so low
    - 14-Aug peak in A20
    - would in-river fisheries prior to 18-Aug be impacting on Birkenhead?
- US Late Lates
  - Using average of last 3 A20 DNA for PSn correcting for PSn:GN catch ratio
- Area B – to close as previous: Johnstone Strait @ noon; A20 @ 2pm

Area/Group	Decisions
B	Closes as scheduled
D	
E	
G	
H	
Recreational	To close 2400 16-Aug (marine, not incl FR)
Pilot Sales	
Sel. Fish.	
US	

August 14, 2002 – W - Fraser River Panel (FRP) call

	Sockeye Stock Groupings				
	Early Stuart	Early Summer	Mid-Summer	(Late Run)	
				Birkenhead	"Late Lates"
50% level	105K	678K	9M	421K	3.2M
75% level	59K	326K	5.2M	227K	2.1M
Panel approved	63K	800K	7.0M	227K	4.0M

FRP Bilateral

- Area B fishery over weekend for 300K actually caught 420K (380K in Johnstone Strait; 42K in A20)
- Diversion Rate estimate 77% through Johnstone Strait
- Projected in Gulf (difference between Marine approach estimates and Mission count) of 550K
  - However, do not know who is holding or for how long
- Staff reported total late run impacts based on CTD and 4M run size of :
  - 14.7% marine and test fishing (e.g. 588K/4000K)
  - 16.95% if include inriver fisheries (e.g. 678K/4000K)

August 16, 2002 – F - Fraser River Panel (FRP) call

	Sockeye Stock Groupings				
	Early Stuart	Early Summer	Mid-Summer	(Late Run)	
				Birkenhead	"Late Lates"
50% level	105K	678K	9M	421K	3.2M
75% level	59K	326K	5.2M	227K	2.1M
Panel approved	63K	850K	6.0M	227K	5.5M
US TAC share	-	74.8K	543.2K	7.5K	168.5K
US CTD	-	60.2	280.5	2.6	98.2
US Balance	-	14.6	262.7	4.9	70.3
CDNTAC share	3K	456.2K	3206.8K	44.5K	619.5K
CDN CTD	1.9	268.1	1432.2	21.9	540.8
CDN Balance	1.1	188.1	1774.6	22.6	78.7
FSC Balance	1.1K	17.2K	267.3K	38.4K	118.8K
% of L.Lates harvested to date (in total)					
% of L. Lates harvested to date (excluding in-river catch)					
% of L.Lates harvested to date (in total)					
% of L. Lates harvested to date (excluding in-river catch)					

NOTE: TAC, CTD & Balances are taken from the CDN TAC table "Aug 16-10am"

FRP Bilateral

- Have accounted for 846K E. Summers to date
- Early Summer Run size estimate of 850K was approved by Panel
- Summer Run run size estimate of 6.0M was approved by Panel
- Late Run
  - Diversion is ~80% through Johnstone Strait
  - Having difficulty finding the peak
  - Have seen >10% L. Adams/Shuswap since 24-Jul
  - Most models are using 30d spread, but when using the first occurrence of Lates as start date (e.g. July 24), suggest using 40d spread i.e. 12-Aug as peak date to be conservative
  - Staff indicated sharp drops in late run abundance in the tail of the run have occurred in 1986 and 1990
  - Late Lates estimate at 5.5M accepted by Panel
  - PSC raised point of cut-off date – Panel will discuss on 19-Aug

- Area B commercial fishery
  - Johnstone Strait – averaged the A12 & A13 racial data and applied over all Johnstone Strait catch
  - Area 20 – used PSn test fishery data from day before and day after the actual fishery and averaged
- PSC does not believe that Summers are delaying in the Gulf
- believe that 54% Late Lates are delaying in the Gulf ~920K (by looking at the difference in numbers expected at Mission from approach waters and the actual numbers seen at Mission)
- @5.5M Lates, US has ~60K Late Late share remaining and CDN has a bit under 90K Late Late share remaining
- Staff advised US that GN fisheries in US panel waters would not be directed late run fisheries (e.g. <50% late lates in catch)
- US offered to forego fishing in order for aggregate US-CDN impacts on Late Lates be under 15
- CDN maintained that this was unnecessary
- No fishery recommendations made by CAN or US
- recreational fisheries were left open over the weekend in case there was a run size upgrade on Monday
- Staff propose adopting late run cut-off date of Aug. 15 for cessation of fishing; discussion postponed to Monday

Area/Group	Decisions
B	
D	
E	
G	
H	
Recreational	2359 19-Aug – anticip close in marine waters 2359 20-Aug – anticip close in-river
Pilot Sales	
Sel. Fish.	
US	

August 19, 2002 – M - Fraser River Panel (FRP) call

	Sockeye Stock Groupings				
	Early Stuart	Early Summer	Mid-Summer	(Late Run)	
				Birkenhead	"Late Lates"
50% level	105K	678K	9M	421K	3.2M
75% level	59K	326K	5.2M	227K	2.1M
Panel approved	63K	850K	6.0M	227K	5.5M

- no change in run size estimates
- PSC is a bit worried that Late Lates may not make 5.5M as DNA samples in Area E reduced from 35% to 16% above bridge and 30% below bridge
- estimate 1.3M sockeye potentially delaying in the Gulf
- US re-stipulated their position of not fishing in order to not exceed the 15% combined harvest rate
- CDN re-stated that this was not necessary

•Aug. 17 date for deducting in river late run impacts is a 'moving window'; catches upstream of Steveston to be deducted based movement of fish that entered the river on Aug. 17

August 23, 2002 – F – FRP Bilateral

	Sockeye Stock Groupings				
	Early Stuart	Early Summer	Mid-Summer	(Late Run)	
				Birkenhead	"Late Lates"
50% level	105K	678K	9M	421K	3.2M
75% level	59K	326K	5.2M	227K	2.1M
Panel approved	63K	850K	6.0M	227K	5.8M
US TAC share	-	75.1K	545.3K	7.5K	163K
US CTD	-	60.2	280.5	2.6	98.2
US Balance	-	14.9	264.8	4.9	64.8
CDNTAC share	3K	455.9K	3204.7K	44.5K	947.2K
CDN CTD	1.8	267.7	1683.9	22.1	886.3
CDN Balance	1.2	188.2	1520.8	22.4	60.9
FSC Balance	1.1K	5.7K	167K	9.7K	58.5K
% of L.Lates harvested to date (in total)					17.7%
% of L. Lates harvested to date (excluding in-river catch)					12.9%

Note: TAC, CTD, & Balance information (except for FSC Balance which was taken from CDN TAC table Aug 23) was taken from PSC TAC table "TAC_Aug 23"

Note 2: on 22-Aug, the tech committee got an email saying that about 6700 Late Run sockeye had been caught in FSC fisheries off Langara Island (top end of Queen Charlottes).

FRP Bilateral

- Summer run estimate stays at 6M
- Late Run
  - can account for 5.1M in catch & escapement to date, believe that there is at *least* 400K remaining to come
  - difficult to estimate the Late Run after the peak of migration is past the marine assessment areas as:
    - the delaying behavior in the gulf eliminates using the Cumulative Passage model - which reconstructs the run based on passage through Mission
    - and the Cumulative Normal model assumes a normal distribution - i.e. equal numbers and shape of curve after the peak of the run as before the peak which will be influenced by the spread in run timing used in the model
    - and the models have difficulty dealing with non-normal distributions (in this case, multi-modal)
    - and the Baysian model uses the outputs from the other models (e.g. combines cumulative passage + cumulative normal)
  - basic result - since the test fishing is not dropping off (no real peak, but no strong drop off), and that the cumulative normal estimate is probably a bit low:
  - FRP accepted the run size of 5.8M Lates
  - estimate that there is about 61% Lates delaying in the gulf (from tagging experiment). Gulf troll estimates the number at 1.3M. Model estimates based on what has arrived Mission and what was seen in approach waters estimates 2.3M holding in gulf. PSC thinks it is more along the lines of 2.3M as there are areas (e.g. sandflats) that troll gear cannot access. (Alternative is that the efficiency lines that they have been using in approach waters are too high)
  - there has been a disconnect between the A12 & A13 test fishery catches. PSC has been averaging the two for model/graph purposes. (the days where weather & other vessels "compromised" the test data weren't used - PSC interpolated using surrounding days)
  - there has been some evidence of a strong near shore migration in the Fraser River which may not be accessible to the test fisheries and Mission Hydroacoustics program potentially resulting in a negative bias in the escapement estimate
  - The historical 50% date of Late Run migration into the river is 3rd week of September, so we'll have to wait until then to see if late run fish are behaving "normally"
  - Some discussion re: TAC table calculations for taking in-river prior to 17-Aug Late Run harvest into account for US & CDN fisheries
- CDN stated their intention not to go fishing, but that they believed that the US had enough TAC available to go fishing and should do so
- US stated that they wanted to address the overall 15% harvest ceiling and wanted to know what CDN thought their remaining FSC Late Run impacts would be
- conversation circled around this for a while, ended with CDN saying "we'll look after our portion of the 15% - you look after yours"
- CAN, US, and Staff discussed different methods for calculating TAC's based on discounting of in river catch of late run through Aug. 17. Discrepancy between CAN and PSC approaches.
- US proposes a fishery in 7A on Sat & Sun; 7 & 7A on Monday
  - PSC had objections as this is inconsistent with pre-season plan to protect Lates (but CDN agreed to proposal and it was passed)
- CAN: no fishery recommendations
- US expressed concern over funding cutbacks to DFO's spawning ground enumeration programs and asked the PSC to draft a letter identifying this issue

Area/Group	Decisions
B	
D	
E	
G	
H	
Recreational	
Pilot Sales	
Sel. Fish.	
US	NTI GN 0800-2000hrs w. Iverson-Dock line in place: 24&25-Aug in 7A 26-Aug in 7/7A

August 25, 2002 – Su – FRP Bilateral call

	Sockeye Stock Groupings				
	Early Stuart	Early Summer	Mid-Summer	(Late Run)	
				Birkenhead	"Late Lates"
50% level	105K	678K	9M	421K	3.2M
75% level	59K	326K	5.2M	227K	2.1M
Panel approved	63K	880K	6.2M	227K	5.8M

FRP bilateral

- Summer run size upgraded to 6.2M
- not sure if we're going to get to 5.8M late Lates
  - Mission-based Late run delay estimate was 2.7M (i.e. approximately 60% of fish are delaying) – this would still result in a significant expected enroute & pre-spawn loss
  - PSC acknowledged that is was possible that the Late Run could exceed 6.0M if protracted migration continued
  - CDN request to use A13 Purse Seine test fishing only (i.e. disregard A12) → rejected due to possibility of bias and inconsistency with past practices
- DNA racial data fluctuating significantly making assessment of Summer and Late-lates difficult
- Gulf troll estimate of what is holding in the gulf has increase to 2.2M, CPUE estimate 2.7M
- E. Summers - account for 880K to date - revised run size accordingly
- US refrained from going fishing any longer - stated that in accordance with the pre-season policy of not targeting late Lates and that the 15% is a limit not a target, they would no longer have any marine fisheries

August 27, 2002 – Tu – FRP Bilateral call

	Sockeye Stock Groupings				
	Early Stuart	Early Summer	Mid-Summer	(Late Run)	
				Birkenhead	"Late Lates"
50% level	105K	678K	9M	421K	3.2M
75% level	59K	326K	5.2M	227K	2.1M
Panel approved	63K	880K	6.7M	227K	6.5M

FRP Bilateral

- Summer Run upgraded to 6.7M
- Late Lates upgraded to 6.5M
  - Runs size assessment continues to be difficult – multi-modal migration pattern makes it extremely difficult to assess return
- Birkenhead status improving based on recent racial samples, will come in above 75p - no formal run size recommendation
- Staff estimated that mortality (pre-spawn & en-route) may be between 65% - 90% for Late Lates based on previous year migrations
  - 1999 – 65% enroute & pre-spawn mortality – 2002 migration pattern is following the 1999 pattern
- delaying of late-lates in the gulf supported by radio tagging program data
- Summer run upgrade based on test fishing data and Mission escapement
- Late Late run upgrade based only on test fishing
- Canada proposes fisheries consistent with the 15% Late run exploitation ceiling as shown in table:
  - US expressed concern re: CDN going over its share of 15%
  - US thought CDN should restrict all future fisheries to in-river fisheries
    - CDN: need to balance Late run concerns with domestic allocation objectives

Area/Group	Decisions
B	
D	(in A12/13) 1800hrs 28-Aug - 1200 29-Aug (with possibility of extension)
E	
G	
H	(in A12/13) 0001hr 29-Aug to 2359 30-Aug
Recreational	marine (except 29-1 to 10 i.e. Gulf of Georgia) 0001 28-Aug to 2359 02-Sep with an update on Friday in-river to be decided later (30-Aug to 02-Sep)
Pilot Sales	
Sel. Fish.	
US	

August 30, 2002 – F – FRP Bilateral call

	Sockeye Stock Groupings				
	Early Stuart	Early Summer	Mid-Summer	(Late Run)	
				Birkenhead	"Late Lates"
50% level	105K	678K	9M	421K	3.2M
75% level	59K	326K	5.2M	227K	2.1M
Panel approved	63K	880K	6.7M	227K	6.5M
US TAC share	-	78.4K	615.6K	7.5K	183.3K
US CTD	-	59.8	284.9	2.7	102.7
US Balance	-				80.6
CDNTAC share	3K	473.6K	3582.4K	44.5K	1056.6K
CDN CTD	2.3	276.3	1879.1	26.8	999.4
CDN Balance					57.2
FSC Balance	1.1K	0.1K	112.6K	6.4K	81.3K
% of L.Lates harvested to date (in total)					17.3%
% of L. Lates harvested to date (excluding in-river catch)					12.9%

FRP Bilateral:

- Summer run size estimate remains at 6.7M (6.25M account for to date through catch & escapement & approach waters out to Robson Bight)
  - Summers coming in now are all Quesnel, most likely Mitchell
- Late Run run size estimate remains at 6.5M (6.0M account for to date)
  - Birkenhead remains at 227K run size estimate (120K in catch & esc; another 120K projected en-route)
  - estimate between 2-3M holding Lates in Gulf
  - 29-Aug Cottonwood catch 468 (i.e. way up from day before) average wt 7.2lb and scale analysis estimates at least 5 Weaver fish
  - approximately 25% of Lates up river already
- Can we use Area D fishery number as any form of run size estimate? Seeming anomaly - fishery from 10/11 Aug (i.e. during the presumed peak) caught 5K more fish with 8h more fishing time than the fishery on 28/29 Aug. (but then we had that about face in diversion routes along the way)
- total max projected catch for Area H is 60K
- US statement: have not been fishing up to a max of 15% because they wanted to put those fish on spawning grounds
- PSC - prob end A20 test fishing tonight

Area/Group	Decisions
B	
D	
E	
G	
H	closing 2359 30-Aug
Recreational	All waters closing 2359 Monday 2-Aug
Pilot Sales	
Sel. Fish.	
US	

September 06, 2002 – F – FRP Bilateral call

	Sockeye Stock Groupings				
	Early Stuart	Early Summer	Mid-Summer	(Late Run)	
				Birkenhead	"Late Lates"
50% level	105K	678K	9M	421K	3.2M
75% level	59K	326K	5.2M	227K	2.1M
Panel approved	63K	880K	6.7M	227K	6.5M

- Late Lates
  - 52% are estimate to be delaying for some period of time (at least 3d?)
  - 49% have already gone up river (if 6.5M run size)
    - compare to:
      - 22% by 5-Sep in 1998, with a resulting 35% mortality
      - 39% by 5-Sep in 1999, with a resulting 65% mortality
- US: What is the rationale for continued CDN fishing plans (i.e. Sto:lo FSC) given that CDN has already exceeded their portion of the 15% max harvest?
- CDN: It is the intention of CDN to stay w/in the 15% max
- US: appreciate domestic planning challenges. However, it is obvious that CDN is fishing into US share & that the statements made by the US on 14-Aug (?) still hold
- US recreational fishery is still going – not sure when the catch numbers will be updated

Appendix 1 - 2002 Fraser River Commercial Sockeye Openings – Canada

w/e date	Area/ Gear	Open hour	day	Closed hour	day	total time	Area Opened	FN	Notes
27-Jul	D-CLIP	1800	27-Jul	800	29-Jul	38hr	12-3	512	10 vessels
3-Aug	B-SF	0001	30-Jul	2359	31-Jul	2 days	20-1 2 seines for Selective Fishing payment		2 vessels
3-Aug	B	600	1-Aug	1800	1-Aug	12hr	12-1, 12-3 to 12-5, portions of 12-6 & 12-8; portion of 13-7	540	
3-Aug	B	600	1-Aug	2100	1-Aug	15hr	20-1, 20-3 & 20-4 (portions of these areas)	540	64 vessels
3-Aug	B-test	600	1-Aug	2100	1-Aug	15hr	18 & 29	562	2 vessels
3-Aug	B-SF	0001	2-Aug	2359	2-Aug	1 day	20-1, 20-3 10 seines for Selective Fishing payment		10 vessels
3-Aug	D	600	30-Jul	2100	30-Jul	15hr	11-1, portion of 11-2	530	
3-Aug	D	600	31-Jul	2100	31-Jul	15hr	11-1, portion of 11-2	530	
3-Aug	D	800	30-Jul	600	1-Aug	46hr	12-1, 12-3 to 12-5, portions of 12-6 & 12-8	530	
3-Aug	D	800	30-Jul	600	1-Aug	46hr	13-8, 13-9, & portions of 13-7 & 13-10	530	
3-Aug	D	600	2-Aug	2100	2-Aug	15hr	11-1, portion of 11-2	559	
3-Aug	D	600	3-Aug	2100	3-Aug	15hr	11-1, portion of 11-2	559	
3-Aug	D	800	2-Aug	600	4-Aug	46hr	12-1, 12-3 to 12-5, portions of 12-6 & 12-8	559	
3-Aug	D	800	2-Aug	600	4-Aug	46hr	13-8, 13-9, & portions of 13-7 & 13-10	559	
3-Aug	E	800	1-Aug	1100	1-Aug	3hr	29-7, 29-9 to 29-17	547	
3-Aug	H-CLIP		28-Jul		29-Jul	2 days	12 & 13	513	8 vessels
3-Aug	H-IVQ	1200	29-Jul	2359	5-Aug	7.5 days	12-1, 12-3, 12-4, 13-8, 13-9, 13-27 to 13-32, portion of 13-7		10 vessels
3-Aug	H	0001	30-Jul	2359	31-Jul	48hr	12-1, 12-3, 12-4, 13-8, 13-9, 13-27 to 13-32, portion of 13-7	539	
3-Aug	H	0001	2-Aug	2359	5-Aug	92hr	12-1, 12-3, 12-4, 13-8, 13-9, 13-27 to 13-32, portion of 13-7	561 & 585	
3-Aug	H	0001	3-Aug	2359	5-Aug	72hr	18-1, 18-4, 18-11	585	
3-Aug	H-IVQ	0001	3-Aug	2359	5-Aug	72hr	18-1, 18-4, 18-11		10 vessels
3-Aug	G	0001	28-Jul	2359	3-Aug	7days	portion of 124 to 127	514, 553,	
3-Aug	G	0001	30-Jul	2359	3-Aug	5 days	portion of 123	553&5	
10-Aug	H	0001	4-Aug	2359	5-Aug	2 days	20 1-seine for Area H TAC under collaborative agrmt	594	1 vessel
10-Aug	D-CLIP	600	4-Aug	600	5-Aug	24hr	12-3	589	10 vessels
10-Aug	D	1800	10-Aug	1800	11-Aug	24hr	12-1, 12-3 to 12-5, portions of 12-6 & 12-8	642	
10-Aug	D	1800	10-Aug	1800	11-Aug	24hr	13-8, 13-9, & portions of 13-7 & 13-10	642	
10-Aug	E	800	6-Aug	1100	6-Aug	3hr	29-11 to 29-17, portion 29-9	592	
10-Aug	H	0001	10-Aug	2359	11-Aug	48hr	12-1, 12-3 to 12-5, 13-8, 13-9, 13-27 to 13-32, 18-1, 18-4, 18-11 and portions of 12-6, 12-8, 13-7	641	
17-Aug	B	600	12-Aug	1200	12-Aug	6hr	12-1, 12-3 to 12-5, portions of 12-6 & 12-8; portion of 13-7	644&646	
17-Aug	B	600	12-Aug	1400	12-Aug	8hr	20-1, 20-3 & 20-4 (portions of these areas)	647	29 vessels
17-Aug	E	700	12-Aug	2000	12-Aug	13hr	29-11 to 29-17, portion 29-9	643 & 648	
17-Aug	E	800	14-Aug	2000	14-Aug	12hr	29-11 to 29-17, portion 29-9	664	
31-Aug	H	0001	29-Aug	2359	30-Aug	2 days	13 1 seine fishing Area H TAC for collaborative agrmt.		1 vessel
31-Aug	D	1800	28-Aug	1200	29-Aug	18hr	12-1, 12-3 to 12-5, portions of 12-6 & 12-8	732	
31-Aug	D	1800	28-Aug	1200	29-Aug	18hr	13-8, 13-9, & portions of 13-7 & 13-10	732	
31-Aug	H	0001	29-Aug	2359	30-Aug	48hr	12-1, 12-3, 12-4, 12-5, 13-8, 13-9, 13-27 to 13-32, portions of 12-6, 12-8, 13-7	733	

Appendix 2 - 2002 Open Times for Lower Fraser River First Nations Sockeye Fisheries (Fraser River Mouth to Sawmill Creek)

Week Ending	First Nations Group	Area	Length (hrs)	Open Time/Date	Closed Time/Date	Fishery Type	Gear
21-Jul	Musqueam/Tsawwassen	Below Port Mann Br.	12	0800 Sun, Jul 21	2000 Sun, Jul 21	non-sales	Drift Net & Set Net
21-Jul	Tsleil Waututh	Below Port Mann Br.	closed				
21-Jul	Kwikwetlem	Patullo Br. to Douglas Is.	48	1800 Fri, Jul 19	1800 Sun, Jul 21	non-sales	Drift Net & Set Net
21-Jul	Katzie/Kwantlen	Port Mann Br. To Mission Br.	12	0800 Sat, Jul20	2000 Sat, Jul 20	non-sales	Drift Net & Set Net
21-Jul	Yale	Hope Br. to Sawmill Cr.	48	1800 Fri, Jul 19	1800 Sun, Jul 21	non-sales	Set Net
21-Jul	Sto:lo	Port Mann Br. to Sawmill Creek	48	1800 Fri, Jul 19	1800 Sun, Jul 21	non-sales	Set Net & Dip Net
28-Jul	Musqueam/Tsawwassen	Below Port Mann Br.	closed				
28-Jul	Tsleil Waututh	Below Port Mann Br.	48	1800 Fri, Jul 26	1800 Sun, Jul 28	non-sales	Drift Net & Set Net
28-Jul	Kwikwetlem	Patullo Br. to Douglas Is.	48	1800 Fri, Jul 26	1800 Sun, Jul 28	non-sales	Drift Net & Set Net
28-Jul	Katzie/Kwantlen	Port Mann Br. To Mission Br.	24	0800 Sat, Jul 27 0800 Sun, Jul 28	2000 Sat, Jul 27 2000 Sun, Jul 28	non-sales	Drift Net & Set Net
28-Jul	Yale	Hope Br. to Sawmill Cr.	72	1800 Thu, Jul 25	1800 Sun, Jul 28	non-sales	Set Net & Dip Net
28-Jul	Sto:lo	Port Mann Br. to Sawmill Creek	72	1800 Thu, Jul 25	1800 Sun, Jul 28	non-sales	Set Net & Dip Net
4-Aug	Musqueam/Tsawwassen	Below Port Mann Br.	26	0800 Sat, Aug 03 0800 Sun, Aug 04	2100 Sat, Aug 03 2100 Sun, Aug 04	pilot sales	Drift Net, Set Net
4-Aug	Tsleil Waututh	Below Port Mann Br.	42	1800 Thu, Aug 01 0600 Mon, Aug 05	2100 Fri, Aug 02 2100 Mon, Aug 05	non-sales	Drift Net, Set Net
4-Aug	Semiahmoo	Port Mann Br. To Mission Br.	15	0600 Fri, Aug 02	2100 Fri, Aug 02	non-sales	Drift Net
4-Aug	New Westminster	Douglas Is. To Alex Fraser Br.	12	0600 Mon, Jul 29	1800 Mon, Jul 29	non-sales	Drift Net
4-Aug	Kwikwetlem	Patullo Br. to Douglas Is.	48	1800 Fri, Aug 02	1800 Sun, Aug 04	non-sales	Drift Net, Set Net
4-Aug	Kwikwetlem	Patullo Br. to Douglas Is.	172	1400 Wed, Jul 31	1800 Wed, Aug 07	non-sales	Set Net
4-Aug	Katzie/Kwantlen	Port Mann Br. To Mission Br.	24	0800 Sat, Aug 03 0800 Sun, Aug 04	2000 Sat, Aug 03 2000 Sun, Aug 04	non-sales	Drift Net & Set Net
4-Aug	Yale	Hope Br. to Sawmill Cr.	72	1800 Thu, Aug 01	1800 Sun, Aug 04	non-sales	Set Net & Dip Net
4-Aug	Sto:lo	Port Mann Br. to Sawmill Creek	72	1800 Thu, Aug 01	1800 Sun, Aug 04	non-sales	Set Net & Dip Net

11-Aug	Musqueam	Below Port Mann Br.	12	0900 Wed, Aug 7	2100 Wed, Aug 7	pilot sales	Drift Net, Set Net
11-Aug	Tsawwassen	Below Port Mann Br.	3	1800 Wed, Aug 7	2100 Wed, Aug 7	pilot sales	Drift Net, Set Net
11-Aug	Tsleil Waututh	Below Port Mann Br.	54	0600 Mon, Aug 05 0600 Wed, Aug 07	2100 Mon, Aug 05 2100 Thurs, Aug 08	non-sales	Drift Net, Set Net
11-Aug	Tsleil Waututh	Below Port Mann Br.	48	1800 Fri, Aug 09	1800 Sun, Aug 11	non-sales	Drift Net, Set Net
11-Aug	Semiahmoo	Port Mann Br. To Mission Br.	39	0600 Wed, Aug 07	2100 Thurs, Aug 08	non-sales	Drift Net
11-Aug	New Westminster	Douglas Is. To Alex Fraser Br.	39	0600 Wed, Aug 07	2100 Thurs, Aug 08	non-sales	Drift Net
11-Aug	Kwikwetlem	Patullo Br. to Douglas Is.	48	1600 Fri, Aug 9	1600 Sun, Aug 11	non-sales	Drift Net & Set Net
11-Aug	Katzie/Kwantlen	Port Mann Br. To Mission Br.	24	0800 Sat, Aug 10 0800 Sun, Aug 11	2000 Sat, Aug 10 2000 Sun, Aug 11	non-sales	Drift Net & Set Net
11-Aug	Yale	Hope Br. to Sawmill Cr.	72	1800 Thu, Aug 8	1800 Sun, Aug 11	non-sales	Set Net & Dip Net
11-Aug	Sto:lo	Port Mann Br. to Sawmill Creek	72	1800 Thu, Aug 8	1800 Sun, Aug 11	non-sales	Set Net & Dip Net
18-Aug	Musqueam	Below Port Mann Br.	7	0800 Fri, Aug 16	1700 Fri, Aug 16	pilot sales	Drift Net, Set Net
18-Aug	Tsawwassen	Below Port Mann Br.	7	0800 Fri, Aug 16	1700 Fri, Aug 16	pilot sales	Drift Net, Set Net
18-Aug	Semiahmoo	Port Mann Br. To Mission Br.	15	0600 Fri, Aug 16	2100 Fri, Aug 16	non-sales	Drift Net
18-Aug	Kwikwetlem	Patullo Br. to Douglas Is.	61	0800 Fri, Aug 16	2100 Sun, Aug 18	non-sales	Drift Net & Set Net
18-Aug	Katzie/Kwantlen	Port Mann Br. To Mission Br.	24	0800 Sat, Aug 17 0800 Sun, Aug 18	2000 Sat, Aug 17 2000 Sun, Aug 18	non-sales	Drift Net & Set Net
18-Aug	Yale	Hope Br. to Sawmill Cr.	72	1800 Thu, Aug 15	1800 Sun, Aug 18	non-sales	Set Net & Dip Net
18-Aug	Sto:lo	Port Mann Br. to Sawmill Creek	72	1800 Thu, Aug 15	1800 Sun, Aug 18	non-sales	Set Net & Dip Net
25-Aug	Musqueam	Below Port Mann Br.	closed				
25-Aug	Tsawwassen	Below Port Mann Br.	closed				
25-Aug	Tsleil Waututh	Below Port Mann Br.	63	0600 Fri, Aug 23	2100 Sun, Aug 25	non-sales	Drift Net, Set Net
25-Aug	Semiahmoo	Port Mann Br. To Mission Br.	closed				
25-Aug	Kwikwetlem	Patullo Br. to Douglas Is.	52	1600 Fri, Aug 23	2000 Sun, Aug 25	non-sales	Drift Net & Set Net
25-Aug	Katzie/Kwantlen	Port Mann Br. To Mission Br.	24	0800 Sat, Aug 24 0800 Sun, Aug 25	2000 Sat, Aug 24 2000 Sun, Aug 25	non-sales	Drift Net & Set Net
25-Aug	Sto:lo	Port Mann Br. to Sawmill Creek	72	1800 Thu, Aug 22	1800 Sun, Aug 25	non-sales	Set Net & Dip Net
25-Aug	Yale	Hope Br. to Sawmill Cr.	72	1800 Thu, Aug 22	1800 Sun, Aug 25	non-sales	Set Net & Dip Net

1-Sep	Musqueam	Below Port Mann Br.	closed				
1-Sep	Tsawwassen	Below Port Mann Br.	closed				
1-Sep	Tsleil Waututh	Below Port Mann Br.	closed				
1-Sep	Semiahmoo	Port Mann Br. To Mission Br.	closed				
1-Sep	Kwikwetlem	Patullo Br. to Douglas Is.	48	1800 Fri, Aug 30	1800 Sun Sep 1	non-sales	Drift Net & Set Net
1-Sep	Katzie/Kwantlen	Port Mann Br. To Mission Br.	24	0800 Sat, Aug 31 0800 Sun, Sep 1	2000 Sat, Aug 31 2000 Sun, Sep 1	non-sales	Drift Net & Set Net
1-Sep	Sto:lo	Port Mann Br. to Sawmill Creek	72	1800 Thu, Aug 29	1800 Sun, Sep 1	non-sales	Set Net & Dip Net
1-Sep	Yale	Hope Br. to Sawmill Cr.	72	1800 Thu, Aug 29	1800 Sun, Sep 1	non-sales	Set Net & Dip Net
8-Sep	Musqueam	Below Port Mann Br.	closed				
8-Sep	Tsawwassen	Below Port Mann Br.	closed				
8-Sep	Katzie / Kwantlen	Port Mann Br. To Mission Br.	closed				
8-Sep	Sto:lo	Mission to Hope Bridge	48	0600 Thu, Sept 5	0600 Sat, Sept 7	non-sales	Set Net & Dip Net
8-Sep	Sto:lo	Hope Br. to Sawmill Cr.	72	0600 Thu, Sept 5	0600 Sun, Sept 8	non-sales	Set Net & Dip Net
8-Sep	Yale	Hope Br. to Sawmill Cr.	72	0600 Thu, Sept 5	0600 Sun, Sept 8	non-sales	Set Net & Dip Net

Appendix 3 - 2002 Open Times for the Upper Fraser River First Nations Fisheries (above Sawmill Creek)

Wk Ending	Species	First Nations Groups	Area	Length	Open Time/Date	Closed Time/Date	Gear
July 7	Chinook (non-retention sockeye)	NNTC / NWSFA	Samwill Creek to Texas Creek/Thompson River downstream of	7 days	1800 Sun June 30	1800 Sun July 7	Dip/ Rod & Reel
July 7	Chinook (non-retention sockeye)	Stl'atl'imx/Xaxli'p	Texas Creek to Kelly Creek	7 days	1800 Sun June 30	1800 Sun July 7	Dip/ Rod & Reel
July 7	Chinook (non-retention sockeye)	Whispering Pines	Kelly Creek to Barney Creek	7 days	1800 Sun June 30	1800 Sun July 7	Dip
July 7	Chinook (non-retention sockeye)	Highbar Band	Barney Creek to French Bar Creek	7 days	1800 Sun June 30	1800 Sun July 7	Dip/ Rod & Reel
July 14	Chinook only (non-retention sockeye)	NNTC / NWSFA	Sawmill Creek to Texas Creek/Thompson River downstream of	7 days	1800 Sun July 7	1800 Sun July 14	Dip/ Rod & Reel
July 14	Chinook only (non-retention sockeye)	Stl'atl'imx/Xaxli'p	Texas Creek to Kelly Creek	7 days	1800 Sun July 7	1800 Sun July 14	Dip/ Rod & Reel
July 14	Chinook only (non-retention sockeye)	Whispering Pines	Kelly Creek to Barney Creek	7 days	1800 Sun July 7	1800 Sun July 14	Dip/ Rod & Reel
July 14	Chinook only (non-retention sockeye)	Highbar Band	Barney Creek to French Bar Creek	7 days	1800 Sun July 7	1800 Sun July 14	Dip
July 21	Chinook only (non-retention sockeye)	NNTC / NWSFA	Sawmill Creek to Texas Creek/Thompson River downstream of	7 days	1800 Sun July 14	1800 Sun July 21	Dip/ Rod & Reel
July 21	Chinook only (non-retention sockeye)	Stl'atl'imx/Xaxli'p	Texas Creek to Kelly Creek	7 days	1800 Sun July 14	1800 Sun July 21	Dip
July 21	Chinook only (non-retention sockeye)	Whispering Pines	Kelly Creek to Barney Creek	7 days	1800 Sun July 14	1800 Sun July 21	Dip/ Rod & Reel
July 21	Chinook only (non-retention sockeye)	Highbar Band	Barney Creek to French Bar Creek	7 days	1800 Sun July 14	1800 Sun July 21	Dip
July 28	Chinook (non-retention sockeye)	NNTC/NWSFA	Fraser R - Sawmill Cr. to Texas Cr./Thompson R. downstream of the Bonaparte River	3	1800 Sun July 21	1800 Wed July 24	Dip net, Angling
July 28	Chinook (non-retention sockeye)	Stl'atl'imx/Xaxli'p	Fraser R - Texas Creek to Kelly Creek	4	1800 Sun July 21	0500 Thu July 25	Dip net
July 28	Chinook (non-retention sockeye)	Whispering Pines	Fraser R - Kelly Creek to Barney Creek	5	1800 Sun July 21	1800 Fri July 26	Dip net, Angling
July 28	Chinook (non-retention sockeye)	Highbar Band	Fraser R - Barney Creek to French Bar Creek	5	1800 Sun July 21	1800 Fri July 26	Dip net
July 28	Sockeye/Chinook	NNTC/NWSFA	Fraser R - Sawmill Cr. to Texas Cr./Thompson R. downstream of the Bonaparte River	4	1800 Wed July 24	1800 Sun July 28	Gill net, Dip net, Angling
July 28	Sockeye/Chinook	Stl'atl'imx/Xaxli'p	Fraser R - Texas Creek to Kelly Creek	3	0500 Thu July 25	2200 Sun July 28	Gill net, Dip net
July 28	Sockeye/Chinook	Whispering Pines	Fraser R - Kelly Creek to Barney Creek	2	1800 Fri July 26	1800 Sun July 28	Gill net, Dip net
July 28	Sockeye/Chinook	Highbar Band	Fraser R - Barney Creek to French Bar Creek	2	1800 Fri July 26	1800 Sun July 28	Gill net, Dip net
July 28	Chinook (non-retention sockeye)	CTC/TNG/Esketemc	Fraser R - Deadman Creek to the confluence of the Chilcotin River	4	1800 Sun July 21	1800 Thurs July 25	Dip net
July 28	Chinook / Sockeye	CTC/TNG/Esketemc	Fraser R - Deadman Creek to the confluence of the Chilcotin River	2	1800 Fri July 26	1800 Sun July 28	Dip net
July 28	Chinook (non-retention sockeye)	CTC/TNG/Esketemc	Fraser R - confluence with Chilcotin River upstream to Alexandria	7	1800 Sun July 21	1800 Sun July 28	Dip Net
July 28	Chinook/Sockeye	TNG	Chilko and Chilcotin Rivers	7	1800 Sun July 21	1800 Sun July 28	Dip Net; Hook & Line; Gaffs (Chilko River only)
July 28	Chinook (non-retention sockeye)	Red Bluff	Fraser R - Alexandria upstream to Moffat bridge	5	1800 Sun July 21	1800 Sun July 28	Dip Net
July 28	Sockeye/Chinook	Red Bluff	Quesnel River from Fraser confluence to BC Rail Bridge	7	1800 Sun July 21	1800 Sun July 28	Dip Net
July 28	Chinook (non-retention sockeye)	LTN	Fraser R - Never Cr to Salmon River / Nechako River upstream to Isle Pierre	7	1800 Sun July 21	1800 Sun July 28	Dip Net
July 28	Sockeye/Chinook	LTN	Bowron R.- from the confluence of the Fraser upstream to FSR Bridge	7	1800 Sun July 21	1800 Sun July 28	Dip Net
July 28	Chinook (non-retention sockeye)	CSTC/TLA	Nechako River - upstream of Isle Pierre and Stuart River system	7	1800 Sun July 21	1800 Sun July 28	Dip Net; Beach Seine/Trap/Fence (in specified areas only)
July 28	Chinook / Sockeye	Shuswap FN Bands	Thompson R. watershed upstream of Bonaparte (specific locations)	7	8-Jul-02	31-Dec-02	Gill/Dip Net; Beach Seine; Rod & Reel; Traps
July 28	Chinook	Okanagan First Nation Bands	Chinook - Mid Shuswap R.	7	NA	NA	Nets; Hook & Line; Gaffs; Spears

Aug 4	Sockeye/Chinook	NNTC/NWSFA	Fraser R - Sawmill Cr. to Texas Cr./Thompson R. downstream of the Bonaparte River	7	1800 Sun July 28	1800 Sun Aug 4	Gill net, Dip net, Angling
Aug 4	Sockeye/Chinook	Stl'atl'imx/Xaxli'p	Fraser R - Texas Creek to Kelly Creek	7	1800 Sun July 28	1800 Sun Aug 4	Gill net, Dip net (Angling - Xaxli'p lands only)
Aug 4	Sockeye/Chinook	Whispering Pines	Fraser R - Kelly Creek to Barney Creek	7	1800 Sun July 28	1800 Sun Aug 4	Gill net, Dip net, Angling
Aug 4	Sockeye/Chinook	Highbar Band	Fraser R - Barney Creek to French Bar Creek	7	1800 Sun July 28	1800 Sun Aug 4	Gill net, Dip net
Aug 4	Sockeye/Chinook	CTC/TNG/Esketemc	Fraser R - Deadman Creek to the confluence of the Chilcotin River	7	1800 Sun July 28	1800 Sun Aug 4	Dip net
Aug 4	Sockeye/Chinook	CTC/TNG/Esketemc	Fraser R - confluence with Chilcotin River upstream to Alexandria	7	1800 Sun July 28	1800 Sun Aug 4	Dip Net
Aug 4	Sockeye/Chinook	CTC/TNG/Esketemc	Chilko and Chilcotin Rivers	7	1800 Sun July 28	1800 Sun Aug 4	Dip Net; Hook & Line; (both) Gaffs (Chilko River only)
Aug 4	Chinook (non-retention sockeye)	Red Bluff	Fraser R - Alexandria upstream to Moffat bridge	1	1800 Sun July 28	1800 Mon July 29	Dip Net
Aug 4	Sockeye/Chinook	Red Bluff	Fraser R - Alexandria upstream to Moffat bridge	6	1800 Mon July 29	1800 Sun Aug 4	Dip Net
Aug 4	Sockeye/Chinook	Red Bluff	Quesnel River from Fraser confluence to BC Rail Bridge	7	1800 Sun July 28	1800 Sun Aug 4	Dip Net
Aug 4	Chinook (non-retention sockeye)	LTN	Fraser R - Naver Cr to Salmon River / Nechako River upstream to Isle Pierre	5	1800 Sun July 28	1800 Fri Aug 2/3	Dip Net
Aug 4	Sockeye/Chinook	LTN	Fraser R - Naver Cr to Salmon River / Nechako River upstream to Isle Pierre	2 (1)	1800 Fri Aug 2 (Fraser River) 1800 Sat Aug 3 (Nechako)	1800 Sun Aug 4	Gill net; Dip net
Aug 4	Sockeye/Chinook	LTN	Bowron R. - from the confluence of the Fraser upstream to FSR Bridge	7	1800 Sun July 28	1800 Sun Aug 4	Dip Net
Aug 4	Chinook (non-retention sockeye)	CSTC/TLA	Nechako River - upstream of Isle Pierre and Stuart River system	7	1800 Sun July 28	1800 Mon Aug 5	Dip Net; Beach Seine/Trap/Fence (in specified areas only)
Aug 4	Chinook / Sockeye	Shuswap FN Bands	Thompson R. watershed upstream of Bonaparte (specific locations)	7	8-Jul-02	31-Dec-02	Gill/Dip Net; Beach Seine; Rod & Reel; Traps
Aug 4	Chinook	Okanagan First Nation Bands	Chinook - Mid Shuswap R.	7	NA	NA	Nets; Hook & Line; Gaffs; Spears
Aug 11	Sockeye/Chinook	NNTC/NWSFA	Fraser R - Sawmill Cr. to Texas Cr./Thompson R. downstream of the Bonaparte River	7	1800 Sun Aug 4	1800 Sun Aug 11	Gill net, Dip net, Angling
Aug 11	Sockeye/Chinook	Stl'atl'imx/Xaxli'p	Fraser R - Texas Creek to Kelly Creek	7 (daylight only)	0500 Mon Aug 5	2200 Sun Aug 11	Gill net, Dip net (Angling - Xaxli'p lands only)
Aug 11	Sockeye/Chinook	Whispering Pines	Fraser R - Kelly Creek to Barney Creek	7	1800 Sun Aug 4	1800 Sun Aug 11	Gill net, Dip net, Angling
Aug 11	Sockeye/Chinook	Highbar Band	Fraser R - Barney Creek to French Bar Creek	7	1800 Sun Aug 4	1800 Sun Aug 11	Gill net, Dip net
Aug 11	Sockeye/Chinook	CTC/TNG/Esketemc	Fraser R - Deadman Creek to the confluence of the Chilcotin River	7	1800 Sun Aug 4	1800 Sun Aug 11	Dip net
Aug 11	Sockeye/Chinook	CTC/TNG/Esketemc	Fraser R - confluence with Chilcotin River upstream to Alexandria	7	1800 Sun Aug 4	1800 Sun Aug 11	Dip Net
Aug 11	Sockeye/Chinook	CTC/TNG/Esketemc	Chilko and Chilcotin Rivers	7	1800 Sun Aug 4	1800 Sun Aug 11	Dip Net; Hook & Line; (both) Gaffs (Chilko River only)
Aug 11	Sockeye/Chinook	Red Bluff	Fraser R - Alexandria upstream to Moffat bridge	7	1800 Sun Aug 4	1800 Sun Aug 11	Dip Net
Aug 11	Sockeye/Chinook	Red Bluff	Quesnel River from Fraser confluence to BC Rail Bridge	7	1800 Sun Aug 4	1800 Sun Aug 11	Dip Net
Aug 11	Sockeye/Chinook	LTN	Fraser R - Naver Cr to Salmon River / Nechako River upstream to Isle Pierre	7	1800 Sun Aug 4	1800 Sun Aug 11	Gill net; Dip net
Aug 11	Sockeye/Chinook	LTN	Bowron R. - from the confluence of the Fraser upstream to FSR Bridge	7	1800 Sun Aug 4	1800 Sun Aug 11	Dip Net
Aug 11	Sockeye/Chinook	CSTC/TLA	Nechako River - upstream of Isle Pierre and Stuart River system	6	1800 Mon Aug 5	1800 Sun Aug 11	Dip Net; Beach Seine/Trap/Fence (in specified areas only)
Aug 11	Sockeye/Chinook	Shuswap FN Bands	Thompson R. watershed upstream of Bonaparte (specific locations)	7	9-Jul-02	31-Dec-02	Gill/Dip Net; Beach Seine; Rod & Reel; Traps
Aug 11	Chinook	Okanagan First Nation Bands	Chinook - Mid Shuswap R.	7	NA	NA	Nets; Hook & Line; Gaffs; Spears

Aug 18	Sockeye/Chinook	NNTC/NWSFA	Fraser R - Sawmill Cr. to Texas Cr./Thompson R. downstream of the Bonaparte River	7	1800 Sun Aug 11	1800 Sun Aug 18	Gill net, Dip net, Angling
Aug 18	Sockeye/Chinook	Stl'atl'imx/Xaxli'p	Fraser R - Texas Creek to Kelly Creek	7 (dailylight only)	0500 Mon Aug 12	2200 Sun Aug 18	Gill net, Dip net (Angling - Xaxli'p lands only)
Aug 18	Sockeye/Chinook	Whispering Pines	Fraser R - Kelly Creek to Barney Creek	7	1800 Sun Aug 11	1800 Sun Aug 18	Gill net, Dip net, Angling
Aug 18	Sockeye/Chinook	Highbar Band	Fraser R - Barney Creek to French Bar Creek	7	1800 Sun Aug 11	1800 Sun Aug 18	Gill net, Dip net
Aug 18	Sockeye/Chinook	CTC/TNG/Esketemc	Fraser R - Deadman Creek to the confluence of the Chilcotin River	7	1800 Sun Aug 11	1800 Sun Aug 18	Dip net
Aug 18	Sockeye/Chinook	CTC/TNG/Esketemc	Fraser R - confluence with Chilcotin River upstream to Alexandria	7	1800 Sun Aug 11	1800 Sun Aug 18	Dip Net
Aug 18	Sockeye/Chinook	CTC/TNG/Esketemc	Chilko and Chilcotin Rivers	7	1800 Sun Aug 11	1800 Sun Aug 18	Dip Net; Hook & Line; (both) Gaffs (Chilko River only)
Aug 18	Sockeye/Chinook	Red Bluff	Fraser R - Alexandria upstream to Moffat bridge	7	1800 Sun Aug 11	1800 Sun Aug 18	Dip Net
Aug 18	Sockeye/Chinook	Red Bluff	Quesnel River from Fraser confluence to BC Rail Bridge	7	1800 Sun Aug 11	1800 Sun Aug 18	Dip Net
Aug 18	Sockeye/Chinook	LTN	Fraser R - Naver Cr to Salmon River / Nechako River upstream to Isle Pierre	7	1800 Sun Aug 11	1800 Sun Aug 18	Gill net; Dip net
Aug 18	Sockeye/Chinook	LTN	Bowron R.- from the confluence of the Fraser upstream to FSR Bridge	7	1800 Sun Aug 11	1800 Sun Aug 18	Dip Net
Aug 18	Sockeye/Chinook	CSTC/TLA	Nechako River - upstream of Isle Pierre and Stuart River system	7	1800 Sun Aug 11	1800 Sun Aug 18	Dip Net; Beach Seine/Trap/Fence (in specified areas only)
Aug 18	Sockeye/Chinook	Shuswap FN Bands	Thompson R. watershed upstream of Bonaparte (specific locations)	7	8-Jul-02	31-Dec-02	Gill/Dip Net; Beach Seine; Rod & Reel; Traps
Aug 18	Chinook	Okanagan First Nation Bands	Chinook - Mid Shuswap R.	7	NA	NA	Nets; Hook & Line; Gaffs; Spears
Aug 25	Sockeye/Chinook	NNTC/NWSFA	Fraser R - Sawmill Cr. to Texas Cr./Thompson R. downstream of the Bonaparte River	7	1800 Sun Aug 18	1800 Sun Aug 25	Gill net, Dip net, Angling
Aug 25	Sockeye/Chinook	Stl'atl'imx/Xaxli'p	Fraser R - Texas Creek to Kelly Creek	7 (dailylight only)	0500 Mon Aug 19	2200 Sun Aug 25	Gill net, Dip net (Angling - Xaxli'p lands only)
Aug 25	Sockeye/Chinook	Whispering Pines	Fraser R - Kelly Creek to Barney Creek	7	1800 Sun Aug 18	1800 Sun Aug 25	Gill net, Dip net, Angling
Aug 25	Sockeye/Chinook	Highbar Band	Fraser R - Barney Creek to French Bar Creek	7	1800 Sun Aug 18	1800 Sun Aug 25	Gill net, Dip net
Aug 25	Sockeye/Chinook	CTC/TNG/Esketemc	Fraser R - Deadman Creek to the confluence of the Chilcotin River	7	1800 Sun Aug 18	1800 Sun Aug 25	Dip net
Aug 25	Sockeye/Chinook	CTC/TNG/Esketemc	Fraser R - confluence with Chilcotin River upstream to Alexandria	7	1800 Sun Aug 18	1800 Sun Aug 25	Dip Net
Aug 25	Sockeye/Chinook	CTC/TNG/Esketemc	Chilko and Chilcotin Rivers	7	1800 Sun Aug 18	1800 Sun Aug 25	Dip Net; Hook & Line; (both) Gaffs (Chilko River only)
Aug 25	Sockeye/Chinook	Red Bluff	Fraser R - Alexandria upstream to Moffat bridge	7	1800 Sun Aug 18	1800 Sun Aug 25	Dip Net
Aug 25	Sockeye/Chinook	Red Bluff	Quesnel River from Fraser confluence to BC Rail Bridge	7	1800 Sun Aug 18	1800 Sun Aug 25	Dip Net
Aug 25	Sockeye/Chinook	LTN	Fraser R - Naver Cr to Salmon River / Nechako River upstream to Isle Pierre	7	1800 Sun Aug 18	1800 Sun Aug 25	Gill net; Dip net
Aug 25	Sockeye/Chinook	LTN	Bowron R.- from the confluence of the Fraser upstream to FSR Bridge	7	1800 Sun Aug 18	1800 Sun Aug 25	Dip Net
Aug 25	Sockeye/Chinook	CSTC/TLA	Nechako River - upstream of Isle Pierre and Stuart River system	7	1800 Sun Aug 18	1800 Sun Aug 25	Dip Net; Beach Seine/Trap/Fence (in specified areas only)
Aug 25	Sockeye/Chinook	Shuswap FN Bands	Thompson R. watershed upstream of Bonaparte (specific locations)	7	8-Jul-02	31-Dec-02	Gill/Dip Net; Beach Seine; Rod & Reel; Traps
Aug 25	Chinook	Okanagan First Nation Bands	Chinook - Mid Shuswap R.	7	NA	NA	Nets; Hook & Line; Gaffs; Spears

Sept 1	Sockeye/Chinook	NNTC/NWSFA	Fraser R - Sawmill Cr. to Texas Cr./Thompson R. downstream of the Bonaparte River	7	1800 Sun Aug 25	1800 Sun Sept 1	Gill net, Dip net, Angling
Sept 1	Sockeye/Chinook	Stl'atl'imx/Xaxli'p	Fraser R - Texas Creek to Kelly Creek	7 (dailylight only)	0500 Mon Aug 26	2200 Sun Sept 1	Gill net, Dip net (Angling - Xaxli'p lands only)
Sept 1	Sockeye/Chinook	Whispering Pines	Fraser R - Kelly Creek to Barney Creek	7	1800 Sun Aug 25	1800 Sun Sept 1	Gill net, Dip net, Angling
Sept 1	Sockeye/Chinook	Highbar Band	Fraser R - Barney Creek to French Bar Creek	7	1800 Sun Aug 25	1800 Sun Sept 1	Gill net, Dip net
Sept 1	Sockeye/Chinook	CTC/TNG/Esketemc	Fraser R - Deadman Creek to the confluence of the Chilcotin River	7	1800 Sun Aug 25	1800 Sun Sept 1	Dip net
Sept 1	Sockeye/Chinook	CTC/TNG/Esketemc	Fraser R - confluence with Chilcotin River upstream to Alexandria	7	1800 Sun Aug 25	1800 Sun Sept 1	Dip Net
Sept 1	Sockeye/Chinook	CTC/TNG/Esketemc	Chilko and Chilcotin Rivers	7	1800 Sun Aug 25	1800 Sun Sept 1	Dip Net; Hook & Line; (both) Gaffs (Chilko River only)
Sept 1	Sockeye/Chinook	Red Bluff	Fraser R - Alexandria upstream to Moffat bridge	7	1800 Sun Aug 25	1800 Sun Sept 1	Dip Net
Sept 1	Sockeye/Chinook	Red Bluff	Quesnel River from Fraser confluence to BC Rail Bridge	7	1800 Sun Aug 25	1800 Sun Sept 1	Dip Net
Sept 1	Sockeye/Chinook	LTN	Fraser R - Naver Cr to Salmon River / Nechako River upstream to Isle Pierre	7	1800 Sun Aug 25	1800 Sun Sept 1	Gill net; Dip net
Sept 1	Sockeye/Chinook	LTN	Bowron R.- from the confluence of the Fraser upstream to FSR Bridge	7	1800 Sun Aug 25	1800 Sun Sept 1	Dip Net
Sept 1	Sockeye/Chinook	CSTC/TLA	Nechako River - upstream of Isle Pierre and Stuart River system	7	1800 Sun Aug 25	1800 Sun Sept 1	Dip Net; Beach Seine/Trap/Fence (in specified areas only)
Sept 1	Sockeye/Chinook	Shuswap FN Bands	Thompson R. watershed upstream of Bonaparte (specific locations)	7	8-Jul-02	31-Dec-02	Gill/Dip Net; Beach Seine; Rod & Reel; Traps
Sept 1	Chinook	Okanagan First Nation Bands	Chinook - Mid Shuswap R.	7	NA	NA	Nets; Hook & Line; Gaffs; Spears
Sept 8	Sockeye/Chinook	NNTC/NWSFA	Fraser R - Sawmill Cr. to Texas Cr./Thompson R. downstream of the Bonaparte River	7	1800 Sun Sept 1	1800 Sun Sept 8	Gill net, Dip net, Angling
Sept 8	Sockeye/Chinook	Stl'atl'imx/Xaxli'p	Fraser R - Texas Creek to Kelly Creek	7 (dailylight only)	0500 Mon Sept 2	2200 Sun Sept 8	Gill net, Dip net (Angling - Xaxli'p lands only)
Sept 8	Sockeye/Chinook	Whispering Pines	Fraser R - Kelly Creek to Barney Creek	7	1800 Sun Sept 1	1800 Sun Sept 8	Gill net, Dip net, Angling
Sept 8	Sockeye/Chinook	Highbar Band	Fraser R - Barney Creek to French Bar Creek	7	1800 Sun Sept 1	1800 Sun Sept 8	Gill net, Dip net
Sept 8	Sockeye/Chinook	CTC/TNG/Esketemc	Fraser R - Deadman Creek to the confluence of the Chilcotin River	7	1800 Sun Sept 1	1800 Sun Sept 8	Dip net
Sept 8	Sockeye/Chinook	CTC/TNG/Esketemc	Fraser R - confluence with Chilcotin River upstream to Alexandria	7	1800 Sun Sept 1	1800 Sun Sept 8	Dip Net
Sept 8	Sockeye/Chinook	CTC/TNG/Esketemc	Chilko and Chilcotin Rivers	7	1800 Sun Sept 1	1800 Sun Sept 8	Dip Net; Hook & Line; (both) Gaffs (Chilko River only)
Sept 8	Sockeye/Chinook	Red Bluff	Fraser R - Alexandria upstream to Moffat bridge	7	18U0 Sun Sept 1	1800 Sun Sept 8	Dip Net
Sept 8	Sockeye/Chinook	Red Bluff	Quesnel River from Fraser confluence to BC Rail Bridge	7	1800 Sun Sept 1	1800 Sun Sept 8	Dip Net
Sept 8	Sockeye/Chinook	LTN	Fraser R - Naver Cr to Salmon River / Nechako River upstream to Isle Pierre	7	1800 Sun Sept 1	1800 Sun Sept 8	Gill net; Dip net
Sept 8	Sockeye/Chinook	LTN	Bowron R.- from the confluence of the Fraser upstream to FSR Bridge	7	1800 Sun Sept 1	1800 Sun Sept 8	Dip Net
Sept 8	Sockeye/Chinook	CSTC/TLA	Nechako River - upstream of Isle Pierre and Stuart River system	7	1800 Sun Sept 1	1800 Sun Sept 8	Dip Net; Beach Seine/Trap/Fence (in specified areas only)
Sept 8	Sockeye/Chinook	Shuswap FN Bands	Thompson R. watershed upstream of Bonaparte (specific locations)	7	8-Jul-02	31-Dec-02	Gill/Dip Net; Beach Seine; Rod & Reel; Traps
Sept 8	Chinook	Okanagan First Nation Bands	Chinook - Mid Shuswap R.	7	NA	NA	Nets; Hook & Line; Gaffs; Spears

Sept 15	Sockeye/Chinook	NNTC/NWSFA	Fraser R - Sawmill Cr to Texas Cr and Thompson R. downstream of the Bonaparte.	7	1800 Sun Sept 8	1800 Sun Sept 15	Gill net, Dip net, Angling
Sept 15	Sockeye/Chinook	Stl'atl'imx/Xaxli'p	Fraser R - Texas Creek to Kelly Creek	7 (dailylight only)	0500 Mon Sept 9	2200 Sun Sept 15	Gill net, Dip net (Angling - Xaxli'p lands only)
Sept 15	Sockeye/Chinook	Whispering Pines	Fraser R - Kelly Creek to Barney Creek	7	1800 Sun Sept 8	1800 Sun Sept 15	Gill net, Dip net, Angling
Sept 15	Sockeye/Chinook	Highbar Band	Fraser R - Barney Creek to French Bar Creek	7	1800 Sun Sept 8	1800 Sun Sept 15	Gill net, Dip net
Sept 15	Sockeye/Chinook	CTC/TNG/Esketemc	Fraser R - Deadman Creek to the confluence of the Chilcotin River	7	1800 Sun Sept 8	1800 Sun Sept 15	Dip net
Sept 15	Sockeye/Chinook	CTC/TNG/Esketemc	Fraser R - confluence with Chilcotin River upstream to Alexandria	7	1800 Sun Sept 8	1800 Sun Sept 15	Dip Net
Sept 15	Sockeye/Chinook	CTC/TNG/Esketemc	Chilko and Chilcotin Rivers	7	1800 Sun Sept 8	1800 Sun Sept 15	Dip Net; Hook & Line; (both) Gaffs (Chilko River only)
Sept 15	Sockeye/Chinook	Red Bluff	Fraser R - Alexandria upstream to Moffat bridge	7	1800 Sun Sept 8	1800 Sun Sept 15	Dip Net
Sept 15	Sockeye/Chinook	Red Bluff	Quesnel River from Fraser confluence to BC Rail Bridge	7	1800 Sun Sept 8	1800 Sun Sept 15	Dip Net
Sept 15	Sockeye/Chinook	LTN	Fraser R - Naver Cr to Salmon River / Nechako River upstream to Isle Pierre	7	1800 Sun Sept 8	1800 Sun Sept 15	Gill net; Dip net
Sept 15	Sockeye/Chinook	LTN	Bowron R.- from the confluence of the Fraser upstream to FSR Bridge	7	1800 Sun Sept 8	1800 Sun Sept 15	Dip Net
Sept 15	Sockeye/Chinook	CSTC/TLA	Nechako River - upstream of Isle Pierre and Stuart River system	7	1800 Sun Sept 8	1800 Sun Sept 15	Dip Net; Beach Seine/Trap/Fence (in specified areas only)
Sept 15	Sockeye/Chinook	Shuswap FN Bands	Thompson R. watershed upstream of Bonaparte (specific locations)	7	8-Jul-02	31-Dec-02	Gill/Dip Net; Beach Seine, Rod & Reel; Traps
Sept 15	Chinook	Okanagan First Nation Bands	Chinook - Mid Shuswap R.	7	NA	NA	Nets; Hook & Line; Gaffs; Spears
Sept 22	Sockeye/Chinook	NNTC/NWSFA	Fraser R - Sawmill Cr. to Thompson R confluence and the Thompson R. downstream of the Bonaparte River	0	closed	closed	closed
Sept 22	Sockeye/Chinook	NNTC/NWSFA	Fraser R - Thompson confluence to Texas Cr.	7	1800 Sun Sept 15	1800 Sun Sept 22	Gill net, Dip net, Angling
Sept 22	Sockeye/Chinook	Stl'atl'imx/Xaxli'p	Fraser R - Texas Creek to Kelly Creek	7 (dailylight only)	0500 Mon Sept 16	2200 Sun Sept 22	Gill net, Dip net (Angling - Xaxli'p lands only)
Sept 22	Sockeye/Chinook	Whispering Pines	Fraser R - Kelly Creek to Barney Creek	7	1800 Sun Sept 15	1800 Sun Sept 22	Gill net, Dip net, Angling
Sept 22	Sockeye/Chinook	Highbar Band	Fraser R - Barney Creek to French Bar Creek	7	1800 Sun Sept 15	1800 Sun Sept 22	Gill net, Dip net
Sept 22	Sockeye/Chinook	CTC/TNG/Esketemc	Fraser R - Deadman Creek to the confluence of the Chilcotin River	7	1800 Sun Sept 15	1800 Sun Sept 22	Dip net
Sept 22	Sockeye/Chinook	CTC/TNG/Esketemc	Fraser R - confluence with Chilcotin River upstream to Alexandria	7	1800 Sun Sept 15	1800 Sun Sept 22	Dip Net
Sept 22	Sockeye/Chinook	CTC/TNG/Esketemc	Chilko and Chilcotin Rivers	7	1800 Sun Sept 15	1800 Sun Sept 22	Dip Net; Hook & Line; (both) Gaffs (Chilko River only)
Sept 22	Sockeye/Chinook	Red Bluff	Fraser R - Alexandria upstream to Moffat bridge	7	1800 Sun Sept 15	1800 Sun Sept 22	Dip Net
Sept 22	Sockeye/Chinook	Red Bluff	Quesnel River from Fraser confluence to BC Rail Bridge	7	1800 Sun Sept 15	1800 Sun Sept 22	Dip Net
Sept 22	Sockeye/Chinook	LTN	Fraser R - Naver Cr to Salmon River / Nechako River upstream to Isle Pierre	7	1800 Sun Sept 15	1800 Sun Sept 22	Gill net; Dip net
Sept 22	Sockeye/Chinook	LTN	Bowron R.- from the confluence of the Fraser upstream to FSR Bridge	7	1800 Sun Sept 15	1800 Sun Sept 22	Dip Net
Sept 22	Sockeye/Chinook	CSTC/TLA	Nechako River - upstream of Isle Pierre and Stuart River system	7	1800 Sun Sept 15	1800 Sun Sept 22	Dip Net; Beach Seine/Trap/Fence (in specified areas only)
Sept 22	Sockeye/Chinook	Shuswap FN Bands	Thompson R. watershed upstream of Bonaparte (specific locations)	7	8-Jul-02	31-Dec-02	Gill/Dip Net; Beach Seine; Rod & Reel; Traps
Sept 22	Chinook	Okanagan First Nation Bands	Chinook - Mid Shuswap R.	7	NA	NA	Nets; Hook & Line; Gaffs; Spears

Sept 29	Sockeye/Chinook	NNTC/NWSFA	Fraser R - Sawmill Cr. to Ttexas Cr and the Thompson R. downstream of the Bonaparte River	0	closed	closed	closed
Sept 29	Sockeye/Chinook	Stl'atl'imx/Xaxli'p	Fraser R - Texas Creek to Kelly Creek	0	closed	closed	closed
Sept 29	Sockeye/Chinook	Whispering Pines	Fraser R - Kelly Creek to Barney Creek	0	closed	closed	closed
Sept 29	Sockeye/Chinook	Highbar Band	Fraser R - Barney Creek to French Bar Creek	7	1800 Sun Sept 22	1800 Sun Sept 29	Gill net, Dip net
Sept 29	Sockeye/Chinook	CTC/TNG/Esketemc	Fraser R - Deadman Creek to the confluence of the Chilcotin River	7	1800 Sun Sept 22	1800 Sun Sept 29	Dip net
Sept 29	Sockeye/Chinook	CTC/TNG/Esketemc	Fraser R - confluence with Chilcotin River upstream to Alexandria	7	1800 Sun Sept 22	1800 Sun Sept 29	Dip Net
Sept 29	Sockeye/Chinook	CTC/TNG/Esketemc	Chilko and Chilcotin Rivers	7	1800 Sun Sept 22	1800 Sun Sept 29	Dip Net; Hook & Line; (both) Gaffs (Chilko River only)
Sept 29	Sockeye/Chinook	Red Bluff	Fraser R - Alexandria upstream to Moffat bridge	7	1800 Sun Sept 22	1800 Sun Sept 29	Dip Net
Sept 29	Sockeye/Chinook	Red Bluff	Quesnel River from Fraser confluence to BC Rail Bridge	7	1800 Sun Sept 22	1800 Sun Sept 29	Dip Net
Sept 29	Sockeye/Chinook	LTN	Fraser R - Naver Cr to Salmon River / Nechako River upstream to Isle Pierre	7	1800 Sun Sept 22	1800 Sun Sept 29	Gill net; Dip net
Sept 29	Sockeye/Chinook	LTN	Bowron R.- from the confluence of the Fraser upstream to FSR Bridge	7	1800 Sun Sept 22	1800 Sun Sept 29	Dip Net
Sept 29	Sockeye/Chinook	CSTC/TLA	Nechako River - upstream of Isle Pierre and Stuart River system	7	1800 Sun Sept 22	1800 Sun Sept 29	Dip Net; Beach Seine/Trap/Fence (in specified areas only)
Sept 29	Sockeye/Chinook	Shuswap FN Bands	Thompson R. watershed upstream of Bonaparte (specific locations)	7	8-Jul-02	31-Dec-02	Gill/Dip Net; Beach Seine; Rod & Reel; Traps
Sept 29	Chinook	Okanagan First Nation Bands	Chinook - Mid Shuswap R.	7	NA	NA	Nets; Hook & Line; Gaffs; Spears
Oct 20	Sockeye/Chinook	NNTC/NWSFA	Fraser R - Sawmill Cr. to Ttexas Cr and the Thompson R. downstream of the Bonaparte River	0	closed	closed	closed
Oct 20	Sockeye/Chinook	Stl'atl'imx/Xaxli'p	Fraser R - Texas Creek to Kelly Creek	0	closed	closed	closed
Oct 20	Sockeye/Chinook	Whispering Pines	Fraser R - Kelly Creek to Barney Creek	0	closed	closed	closed
Oct 20	Sockeye/Chinook	Highbar Band	Fraser R - Barney Creek to French Bar Creek	0	closed	closed	closed
Oct 20	Sockeye/Chinook	CTC/TNG/Esketemc	Fraser R - Deadman Creek to the confluence of the Chilcotin River	7	1800 Sun Sept 29	2400 Tues Dec 31	Dip net
Oct 20	Sockeye/Chinook	CTC/TNG/Esketemc	Fraser R - confluence with Chilcotin River upstream to Alexandria	7	1800 Sun Sept 29	2400 Tues Dec 31	Dip Net
Oct 20	Sockeye/Chinook	CTC/TNG/Esketemc	Chilko and Chilcotin Rivers	7	1800 Sun Sept 29	2400 Tues Dec 31	Dip Net; Hook & Line; (both) Gaffs (Chilko River only)
Oct 20	Sockeye/Chinook	Red Bluff	Fraser R - Alexandria upstream to Moffat bridge	7	1800 Sun Sept 29	2400 Thurs Oct 31	Dip Net
Oct 20	Sockeye/Chinook	Red Bluff	Quesnel River from Fraser confluence to BC Rail Bridge	7	1800 Sun Sept 29	2400 Thurs Oct 31	Dip Net
Oct 20	Sockeye/Chinook	LTN	Fraser R - Naver Cr to Salmon River / Nechako River upstream to Isle Pierre	7	1800 Sun Sept 29	2400 Thurs Oct 31	Gill net; Dip net
Oct 20	Sockeye/Chinook	LTN	Bowron R.- from the confluence of the Fraser upstream to FSR Bridge	7	1800 Sun Sept 29	2400 Thurs Oct 31	Dip Net
Oct 20	Sockeye/Chinook	CSTC/TLA	Nechako River - upstream of Isle Pierre and Stuart River system	0	closed	closed	closed
Oct 20	Sockeye/Chinook	Shuswap FN Bands	Thompson R. watershed upstream of Bonaparte (specific locations)	7	8-Jul-02	31-Dec-02	Gill/Dip Net; Beach Seine; Rod & Reel; Traps
Oct 20	Chinook	Okanagan First Nation Bands	Chinook - Mid Shuswap R.	7	NA	NA	Nets; Hook & Line; Gaffs; Spears

Appendix 4 - 2002 Fraser River Recreational Sockeye Openings – Canada

Area	Open	Closed	total time (days)	FN	Notes
South Coast Marine waters	29-Jul	19-Aug	22	0528,0684	
	28-Aug	2-Sep	6	0734	
non-retention in 29-1 to 10		8-Aug		0622	
Fraser River Mouth to Alexandra Bridge	2-Aug	20-Aug	19	0541,0554, 0684	daylight hours only in non-tidal
	30-Aug	2-Sep	4	0738	daylight hours only in non-tidal
Fraser River - between confluence with Seton River downstream to Seton powerhouse	9-Aug	25-Aug	17		0600-2100hrs each day
Quesnel River - 500m upstream and downstream of a boundary sign located at Quesnel Forks	24-Aug	2-Sep	10		0600-2100hrs each day
Quesnel Lake - Horsefly Bay	24-Aug	2-Sep	10		0600-2100hrs each day

Daily limits: 4/day in marine & tidal; 2/day in non-tidal